

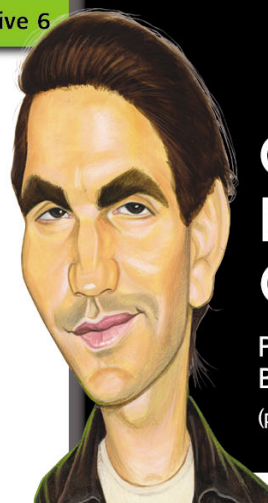
Hardware
Reviewed:

■ ABIT KV8 Pro Mobos ■ DFI 875P-T Mobos ■ Cooler Master CoolDrive 6

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Publication

CPU

COMPUTER POWER USER



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**Bram
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Utilities
& Apps
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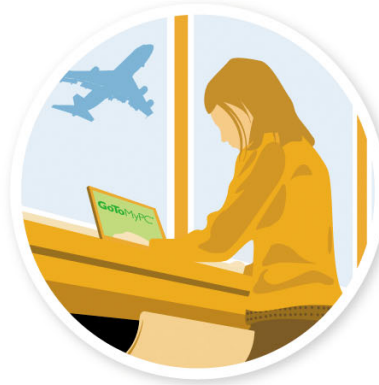


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Orac³ on page 30

“Best Remote-Access Software”

— PC World Magazine 2004



“Easiest Remote Access to Set Up and Use”

— CNET, Editors' Choice 2004



“Ultimate Choice Award for Remote Access”

— Laptop Magazine 2004



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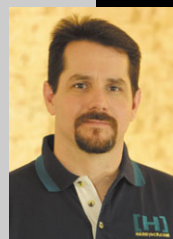
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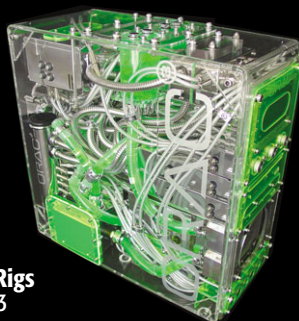
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GREETINGS FROM SAMITLAND

Welcome back to another issue of CPU. We're safely past the summer heat and my outlook on life has noticeably improved. I'm brimming with positivity (weather aside, that positivity is in many ways an ode to your positive feedback). As always, we've been reading your comments and have been taking copious notes. Please keep it coming—your feedback is the gauge by which we measure various aspects of the magazine. Our ultimate goal, of course, is to make the perfect mag for you. Some of our Spotlight cover stories are directly based on requests we've had from you, so keep on sending those suggestions. Coordinating each issue comes from the hard work of many, many talented people that compose our team, and your compliments are always warmly appreciated by all. So thank you for helping make us what we have become. I like to think we're getting better all the time (just like that VW ad jingle).

This month we're proud to return with our annual power-packed software utility guide for 2004. This is the de facto (yeah, I'm obviously biased) guide to the top software products power computer users need to know about. We get down with more than 150 utilities, including off-the-beaten path utils for WinXP/2000 (plus retail shelf-friendly packages), Linux must-haves, Mac OS X picks, and handheld gems. We also reveal some of our columnist's favourite utils—it's the inside scoop (like *The Enquirer*—yeah, right)! But seriously, we have quite the treasure trove of utilities for your pleasure. And if there are any we've omitted, please drop us a line and suggest utils and apps you can't live without. Better yet, jump onto the www.cpumag.com forums and start posting your own recommendations and suggestions. I'm always on the lookout for good utils as are you, and the sharing of expertise will benefit us all. For now, head over to page 46 and enjoy the 21 pages of multiplatform software treasures.

Don't miss out on this month's DRM 10 coverage on page 36 and our blogging piece on page 80. Those are just highlights; we have more of the stuff you love through the issue, including our Doom 3 review on page 94. It's scary as hell, which I suppose is appropriate with Halloween around the corner (in other words, Doom 3 will scare the pants off you). We'll be returning with lots of hardware coverage in the next few months, so prep yourselves for that. As you read this, I'll be in San Francisco at the Intel Developer Forum, meeting some of our columnists and hopefully scoring juicy tidbits for upcoming coverage (which depends on how forthcoming Intel's press team is). Now it's off to prepping wife Julie for her stint with the CDC in Atlanta (I keep hoping she'll come home with one of those FBI-style field jackets with a big yellow CDC stamped on the back). See you in November!



Samit G. Choudhuri, Publication Editor, CPU



Gotcha.
Here it is.



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CORRECTIONS

To clarify our summary of the Hymn .61 beta (page 68, August), Apple uses a proprietary Fairplay Digital Right Management technology. A file's native format is AAC with MPEG-4 encoding.

Is it Shlain, Shain, or Shlain? Our bad, it's Shlain (September's cover). And, by the way, it's McCarran, not McCarron (Sept. page 8).

WindowBlinds does not modify the Windows kernel, as was indicated on page 74 in the September issue.

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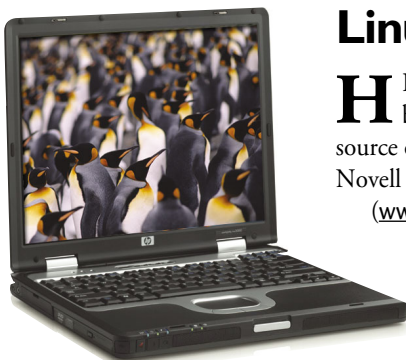


The Barracuda Bites Back

Western Digital has its 10,000rpm Raptor hard drive, and Maxtor has its 300GB DiamondMax 10 with 16MB of cache, and now Seagate (www.seagate.com) bares its teeth with a massive 400GB model that is as fast as it is fat. The Barracuda 7200.8 will come in Ultra ATA and SATA models and offer a 16MB cache option. Seagate claims that the three-disc drive has the highest areal density of any available storage device. It is also the first drive to incorporate next-gen NCQ (native command queuing) technology, which reorganizes the calls made to a hard drive so that the drive heads pick data off the disc in a more efficient order. Pricing was not set at press time, but the drive should be available now. ▲

Look Ma, Mickey's Ears Are Talking!

Your 4-year-old's dream rig is here. Never one to miss a trend (or a marketing opportunity), Disney's new Dream Desk PC is pitched at the fastest growing segment of PC users: kids. With toon stylings, speakers in the ears of the mouse-shaped LCD monitor, and a kid-sized mouse, the \$950 model is decently powered with a 2.66GHz Celeron and Radeon 9100 Pro under the hood. A DVD/CD-RW combo drive and color printer are part of the bundle, as well as a boatload of Disney software. OK, so it's no match for the Alienware super-rig in your den, but hey, it does have a digital pen and drawing tablet. We don't even have one of those. Move over kid, it's our turn. ▲



Linux To Go, Please!

HP thrilled LinuxWorld attendees in August by announcing a Linux-powered notebook, the first from a major computer manufacturer to come standard with the open-source operating system. The nx5000 is a Centrino-powered notebook that will ship with the Novell SuSE Linux OS, as well as OpenOffice, the open-source office application suite (www.openoffice.org). Starting at \$1,140, the nx5000 is otherwise typical, with DVD playback, a CD burner, and wireless and Bluetooth support. While the nx5000 may have limited appeal within the enterprise, Linux-watchers say that it is a notable step in the overall acceptance in the U.S. market of an open-source alternative to Windows. ▲



AirPort Express: The iPod Of Wireless?

You don't need to own a Mac to bite into Apple's latest small wonder. The pocket-sized AirPort Express (\$129) 802.11g base station can share iTunes between a Mac or PC and a home stereo system, or broadcast a Web connection, or share a printer, or extend an existing Wi-Fi network. About the size of a deck of cards and with an embedded AC plug that lets it hang from any outlet, this marvel of wireless convergence has Ethernet, USB, and stereo outputs to handle all of these tasks. The iTunes player software can detect the presence of the device from a Wi-Fi-capable PC or Mac and broadcast its encrypted music through the AirPort to a connected stereo or powered speakers. ▲

Hardware Mole

A Little CD Protection

Stop scratches on your CDs, DVDs, and games before they start, says d_skin (www.d-skin.com), maker of snap-on plastic protection for your discs. The transparent d_skin film is set within a thin plastic frame that snaps onto your disc and covers your CD with a protective shield that it wears while playing in the drive. Even stranger is that this offbeat idea actually worked very well for us when we tried it ourselves. The film fits tightly on the disc, and it plays perfectly in a drive. At \$5.99 for a tin of five, they are cheap enough to protect a library of over-used discs. ▲



Sharp Adds A New Desktop Dimension

Toss the silly 3D specs because now Sharp is letting you see a 3D image on an LCD without goofy peripherals. While pricey at \$1,499, the LL-151-3D is a 15-inch TFT LCD that uses a parallax barrier to divide the emitted light into separate images for the viewer's left and right eye. The brain combines these images and processes the results as having depth. Users can switch between 2D and 3D modes, and bundled software lets the effect work with programs with 3D graphics. For more information on Sharp's 3D technology, see "Sharp Images" on page 34 of the March 2004 issue of *CPU*. ▲

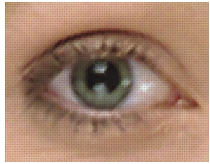


Toshiba's Luggable Home Theater

The 8.7-pound Toshiba Qosmio ("koss-mee-oh") is a new line of convergence notebooks that aims to replace your home theater. The Qosmio's TV tuner and PVR software offer TiVo-like TV recording, and the Harman/Kardon speakers and Tru-Surround XT belt out video and music in simulated surround sound. Cooler still is that multimedia playback is available without even booting into Windows. After all, starting Windows in order to watch "The Sopranos" is no more modern than Great-grandpa waiting for the old tube radio to warm up before enjoying "Fibber McGee and Molly." ▲

Wobulation Doubles Display Resolution

Will Allen figured his printer expertise would come in handy one day in displays. That has come to pass as his employer, HP, launches into the television and projector business with a technology that Allen calls Wobulation. This



technique can double the resolution of a rear-projection TV or digital projector at no extra cost by tapping into a trick that Allen and others at HP developed in the 1990s. It works by offsetting the dots, or pixels in the case of displays, that make up an image so that they smooth out the empty spaces between dots and fool the eye into seeing a much

sharper image. It's like wobbling an image so that it comes into sharper focus. HP created a new image pipeline to implement the technique, which has been designed into a new family of digital light processing chips from Texas Instruments. The chips will be used in HP rear-projection televisions and projectors next year. ▲

Qualcomm Integrates Cell Phone Functions Into One Chip

Everyone wants to cram new features into cell phones, whether it's broadband connectivity, cameras, or 3D games. Qualcomm is trying to make that happen with its new Enhanced Multimedia Platform chipsets, including the MSM6550 and the MSM6150. Next year, the company will debut the RFR6500 chip, which will combine two processors on a single chip. The RFR6500 combines a wireless modem with two different ARM microprocessor cores so that a single chipset can play video, take 4MP (megapixel) digital photos, perform phone functions, display graphics, and run crude operating systems. Not to be outdone, Texas Instruments is also adding multiple processors to its cell phone chips. ▲

IBM's eFUSE Helps Chips Adapt

IBM introduced eFUSE, a chip morphing technology that enables chips that can monitor their own functions and adjust to improve quality, performance, and power consumption. The patented technology combines software techniques with tiny electrical fuses to produce chips that regulate their actions in response to changing conditions. eFUSE can sense when a chip needs a tune-up and alter the circuitry configuration. By activating or deactivating fuses, eFUSE reroutes electrical traffic. If it detects that a chip is malfunctioning because some circuits are operating too fast or too slow, it can throttle down or speed up by changing the voltage in the section of the chip. The morphing can be repeated several times, even after the chip has been packaged and shipped in a product. With eFUSE, IBM has been able to harness a detrimental phenomena dubbed electromigration, using the effect to program a fuse without damaging other parts of a chip. ▲

Watching The Chips Fall

Here is pricing information for AMD and Intel CPUs.

Released	Original price	Current price	Last month's price
AMD Athlon 64 3400+ 1/6/2004	\$417**	\$285	\$404
AMD Athlon 64 3500+ 6/1/2004	\$500**	\$358	\$485
AMD Athlon 64 3700+ 6/1/2004	\$710**	\$512*	\$700*
AMD Athlon 64 3800+ 6/1/2004	\$720**	\$630	\$696
AMD Athlon 64 FX-53 3/18/2004	\$733**	\$745	\$749
Intel Pentium 4 3.06GHz 533MHz FSB 11/14/2002	\$658*	\$218	\$214
Intel Pentium 4 3.0GHz 800MHz FSB 4/21/2003	\$417**	\$201	\$211
Intel Pentium 4 3.0GHz 800MHz FSB 1MB cache 2/2/2004	\$218**	\$217*	\$214*
Intel Pentium 4 3.2GHz 800MHz FSB 6/23/2003	\$637**	\$275*	\$268*
Intel Pentium 4 3.2GHz 800MHz FSB 1MB cache 2/2/2004	\$278**	\$280*	\$277*
Intel Pentium 4 3.4GHz 800MHz FSB 2/2/2004	\$417**	\$429*	\$425*
Intel Pentium 4 Extreme Edition 3.2GHz 2MB cache 800MHz FSB 11/3/2003	\$925**	\$817*	\$830
Intel Pentium 4 Extreme Edition 3.4GHz 2MB cache 800MHz FSB 2/2/2004	\$999**	\$1,043	\$989
Intel Pentium 4 520 2.8GHz 1MB cache 800MHz FSB 90nm 6/27/2004	\$178**	\$199*	\$178**
Intel Pentium 4 530 3.0GHz 1MB cache 800MHz FSB 90nm 6/27/2004	\$218**	\$249*	\$218**
Intel Pentium 4 540 3.2GHz 1MB cache 800MHz FSB 90nm 6/27/2004	\$278**	\$319*	\$278**
Intel Pentium 4 550 3.4GHz 1MB cache 800MHz FSB 90nm 6/27/2004	\$417**	\$415*	\$417**
Intel Pentium 4 560 3.6GHz 1MB cache 800MHz FSB 90nm 6/27/2004	\$637**	\$637**	\$637**

* Retail price

** Manufacturer's price per 1,000 units

Other current prices, if indicated, are lowest OEM prices available through Pricegrabber.com

Delayed Windows 64 Gets A New Name & A Good Deal

The move to 64-bit computing missed a step recently as Microsoft confirmed that the OS formerly known as Windows XP 64-bit Edition For 64-bit Extended Systems won't launch until the first half of 2005. While development and testing of the OS, designed to support the new 64-bit AMD and Intel processors, has run long, Microsoft did shorten the moniker to Windows XP Professional x64 Edition. The company also announced that x64 will be priced the same as WinXP Pro, and current WinXP owners will be able to trade in their 32-bit license for a 64-bit license. Earlier this year, Bill Gates had projected that by the end of 2005, all AMD and most Intel processors would be 64-bit. A year after its original ship date, a 2005 release could dampen consumer enthusiasm for 64-bit processors and hardware makers' eagerness to write new 64-bit drivers, say some analysts. Microsoft is promising that when it is done, the new OS will be able to address 32GB of physical memory and 16TB of virtual memory to deliver much more headroom, memory speed, and improved floating point performance to the most demanding multimedia applications. The latest public beta build of x64 now supports both AMD and Intel processors and is available through Microsoft's "preview program" at www.microsoft.com/windowsxp/64bit/evaluation/upgrade.mspx. ▲

It may be taking its time getting here, but Microsoft is promising better memory and floating point performance from the 64-bit version of Windows and a trade-up program for current Windows XP users.



Software Shorts

Cedega Spells Doom For Linux Users

Linux gamers don't have to wait for a port of Doom 3 to kill fat zombies, says TransGaming Technologies (www.transgaming.com). Cedega 4.0.1 (formerly WineX) is designed to run Windows games seamlessly under Linux, and the company claims it had Doom 3 working correctly on the day the game launched in early August. Cedega supports DirectX 9 and titles that use pixel and vertex shaders. While Cedega does not run all Windows titles under Linux, the TransGaming site maintains a list of games with user rankings of their compatibility and performance. Cedega is available by subscription for \$5 per month. ▲

321 Loses The War

After years of legal battles with movie and software industries over the legality of its disc-copying programs, 321 Studios raised the white flag this summer. The maker of DVD X Copy and Games X Copy closed down after three federal injunctions ruled against its popular titles. Courts determined that by cracking another company's copy protection scheme, 321's products violated the DMCA (Digital Millennium Copyright Act). Within days of the shutdown, the film industry announced it had reached a settlement with 321 that required the defunct company to make "a substantial financial payment" to studios and agree not to sell the software any longer. ▲

Will Apple Get Real?

Apple says that RealNetworks' latest software, Harmony, may be violating the DMCA by letting music tracks purchased on Real's service play on an iPod with its original DRM (digital rights management) system in place. Apple cried foul, claiming Real must have hacked or disabled the iTunes DRM to do this, but Real fired back that it is using accepted practices for creating interoperable software. Until Apple files a suit, it remains a press release war, but the tiff reflects how the digital music industry has become so serious and lucrative so fast. ▲



Fat Pipe TV Takes On Cable

As broadband penetration in the United States rises exponentially, everyone wants a piece of that fat pipe, including television. Microsoft's IPTV (Internet Protocol Television) solution uses the Internet to transmit broadcast, cable, on-demand, and even HDTV programming to a set-top box in the living room. Video material can be encoded and sent through a broadband connection to your television at 1.5Mbps using the Windows Media 9 Series format. According to Ed Graczyk, director of marketing and communication, Microsoft TV, the telcos, and other DSL providers are starting to test the system here and abroad because it gives them a way to compete against cable companies, which, after all, are now starting to invade the telco's territory with VoIP phone services. Unlike cable TV delivery, IPTV offers richer two-way communication and the promise of smoother integration with other networked devices. "If you get a call while watching TV, you could see a caller ID on your set and decide with the remote what to do with that call," says Graczyk. "You'll share photos and music with TV, PC, and cell phone." Expect widespread trials in 2005 and commercial deployment in 2006. (For more with Graczyk, refer to "Technically Speaking" on page 103.) ▲

Spamusement.com Turns Junk Email Into Cartoons

Why get mad at spam when you can make fun of it?

Software programmer Steve Frank may not be much of an artist, but he had a good idea in Spamusement.com. This new site offers Frank's daily single-panel cartoons that are inspired by all of those



familiar spam subject lines that are designed to lure us into opening our junk email. For It Feels So Right, Frank envisions a man sitting in a tub of Tapioca. We've Located Several Horny Women In Your Area! calls up an image of two humorless scientists with a handheld female detecting radar device. He even lampoons spam with spelling mistakes, like Heath Warning (yup, a cartoon with falling Heath candy bars). Frank has been making fun of online culture for years at his equally indispensable Disturbing-Auctions.com, which chronicles the weird stuff people put up for sale online. Styrofoam ghost poop, a set of heads removed from Farrah Fawcett dolls, as well as Dean Martin and Saddam Hussein hand puppets are among our favorites. A forum invites visitors to add their faves, and Frank has compiled the worst of the worst into an online slideshow. Freeze-dried pork chops? A Santa Claus toilet seat cover? ▲

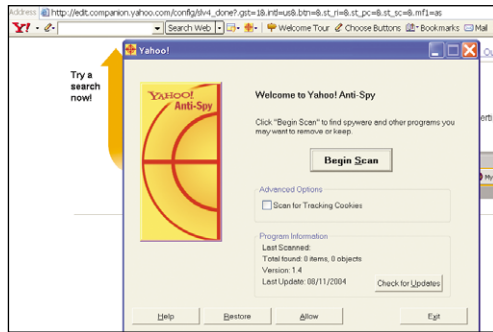


IceRocket Launches Into Search Space



Yes, there is life after the Google-Yahoo! search engine wars. Texas start-up IceRocket (www.icerocket.com) launched its own "fun" approach to search this summer. At IceRocket.com, search results include a screen shot from the site containing your content and a pop-up balloon that shows its traffic, links, and speed rating from Web research service Alexa. Our favorite innovation is the Quick View feature that actually pulls the result content into a scrollable window within your search results page so you can sample the hits quickly without leaving IceRocket. The company is also

experimenting with a mobile phone search service in which you send in an email with your search term as the subject and IceRocket returns results formatted for the mobile environment. IceRocket is a metasearch engine, which polls several other engines (Yahoo!, MSN, etc.), but it also spiders strange new areas such as sites where people post photos of themselves for public "am I hot or not" appraisals. Appropriately enough, IceRocket is partially funded by the opinionated and often-outrageous former Broadcast.com founder and current Dallas Mavericks owner Mark Cuban. ▲



Yahoo! Goes Spy Hunting

The search giants continue their one-upmanship. The new Yahoo! Companion Toolbar shoots one across the box of Google's browser app with integrated Yahoo! Anti-Spy. Co-developed with Pest Patrol, the spy remover runs a system scan right from the IE toolbar. Yahoo! divides the results into items it recommends for immediate deletion (spies) or review (adware), and you can include cookies in the scan. While the line between spyware and adware is fuzzy at best, Yahoo! detects both and lets you decide whether to eject it from your system. In its beta release, Yahoo! Anti-Spy fielded criticism for excluding adware. In this final release, adware is also scanned, including the ubiquitous Claria (formerly Gator) ad network, which is actually a partner of Yahoo!. Nevertheless, the portal says that if adware doesn't want to be treated as a spy, it must disclose its function to users when it installs and offer easy removal. The scan worked quickly in our experience, and it did find a number of culprits, even on a system we had cleaned recently with retail spy hunters. And it's free. ▲

New On The 'Net

Blockbuster Flix At The 'Net Competition

The king of movie rentals is biting back at Netflix with its own Web-based DVD-by-mail rental service. For \$19.99 a month (\$2 less than Netflix), Blockbuster Online (www.blockbuster.com) also lets you keep up to three DVDs out as long as you want, but it sweetens the deal with two free rentals a month from your local Blockbuster retail store. That's throwing around some brick-and-mortar muscle. ▲



MusicMatch Gets MoD

With the release of version 9 of its widely used Musicmatch Jukebox software, Musicmatch (www.musicmatch.com) adds an on-demand streaming media service for \$8.95 per month. Musicmatch On Demand gives subscribers access to over 600,000 tracks for immediate playing online or even sending to nonsubscribers, who can listen to the playlist up to three times. The new software and service combo is meant to let users keep and play all of their music (MP3s, purchased downloads, streaming, and CDs) on one media player. ▲

What's Your City's IQ?

Minneapolis, Minn., is the most literate locale in the United States, according to the Literate Cities 2004 study (www.uww.edu/npa/cities) by the University of Wisconsin-Whitewater, which judged each area's "bookishness" based on newspaper circulation, educational levels, and density of bookstores and libraries. The dedicated site drills into the list of 79 cities and ranks them according to each criterion. Ironically, while this project relies on the Web for its distribution, the level of Internet access in a given city only made up a small piece of one factor in the rankings. ▲

BIOS Upgrades Available Online

Compiled by Kevin Savetz

Before you send another motherboard to the landfill, consider upgrading the BIOS and giving your PC a new outlook on life. Here are a few recently released upgrades. Readers can check out www.cpumag.com/cpuoct04/bios to see our entire upgrade list.

Motherboard	Date Available	URL
KV7	08/02/2004	www.abit-usa.com/downloads/bios/bios_revision.php?categories=1&model=125
AK77-400N	08/05/2004	download.aopen.com.tw/downloads/userdownload_List.asp?Publish=Yes&RecNo=8554&Model=AK77-400N
M7NCD	07/29/2004	www.biostar-usa.com/mbdownloads.asp?model=m7ncd
MPT800	07/23/2004	www.chaintechusa.com/tw/eng/Download/dl_desc.asp?DCSNo=4&PISNo=275
8K9A7I	08/03/2004	www.epox.nl/english/support/bios/socketa.htm
Tiger i7501X (S3022)	08/10/2004	www.tyan.com/support/html/b_s3022.html

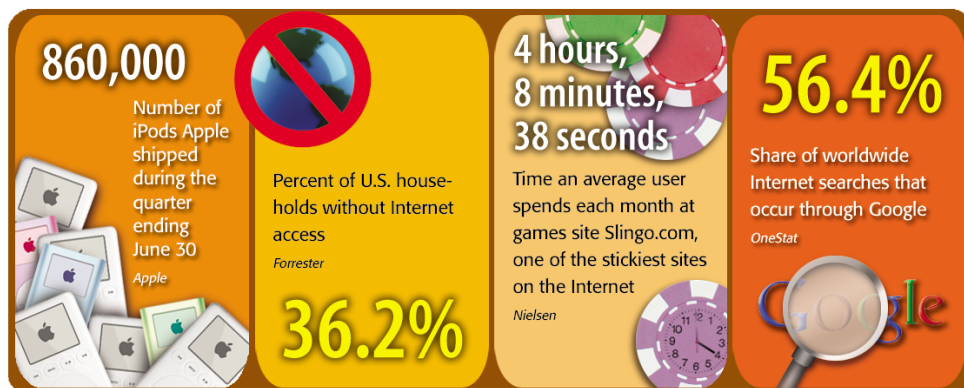
Compiled by Steve Smith



You can help the PC get Dolby-ized. Dolby wants to expand the influence of its familiar Dolby Digital standard on the PC, and it needs a Senior Manager of Technology Strategy to lay down the plan. If you have eight years of experience with PC audio entertainment, you can help Dolby grow the adoption of its audio standards in games and computer hardware. You will evaluate the competitive terrain and try to position Dolby technologies within emerging hardware trends. Obviously, you need to understand the PC architecture backward and forward, but you will also need to convince hardware and software partners that the PC needs yet another multimedia standard. Of course, after leveraging a noise reduction technology for audio tape decks into multi-channel technologies that now dominate movie theaters, music, and home theaters, it would be silly to wager against this relentless company. ▲



RAW DATA



Spam Dissected: Viagra Rules

Male sexual insecurity seems to be the driving force behind much of the unsolicited email we receive. In the first six months of 2004, the largest share of spam email messages sent worldwide were pitching Viagra (14.1%), according to spam solutions provider Commtouch, and the third most popular promotion was for male organ enlargement (7.05%), right behind the mortgage/refinance category (9.68%). In what may be a related development, ads for porn declined to 3.1% of all spam sent. More than half of the world's spam is sent from the United States, but clickthroughs on an astonishing 73.58% of that spam sends those Viagra and mortgage chasers to Web servers in China.

www.commtouch.com/news/english/2004/pr_04063001.shtml

3 Billion Sold

The DVD video disc platform has been one of the fastest successes in media history, with over 103 million players sold in the United States since 1997. According to the Digital Entertainment Group, the DVD industry shipped its 3 billionth disc at the end of Q2 2004.

North American DVD Software Shipments By Quarter (in millions)

Quarter	1997	1998	1999	2000	2001	2002	2003	2004
1	N/A	3.3	11.1	29	69.2	120.1	231.7	332.2
2	N/A	4.1	13.9	33.2	81.7	152.2	195.5	316.8
3	2.3	5.9	29	42.7	75.9	153.3	214.6	
4	3.2	11.8	44	77.5	137.6	259.4	381.5	
Year Total	5.5	25.1	98	182.4	364.4	685.0	1023.3	
Total Shipments		30.6	128.6	311	675.4	1,360.4	2,383.7	3,032.7 (as of 6/30/04)

Source: Digital Entertainment Group

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The StreetPilot® II from Garmin has features found in expensive in-dash navigation systems, plus one very important quality the others don't have. StreetPilot II is portable, so you can have the best in GPS navigation in any car you drive. Look up addresses, attractions and other services, and StreetPilot II will create a route and provide turn-by-turn directions with voice prompts to get you there.

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COMPUSA

by Alex St. John

Organic Computing

The computer this column was written on is a silicon computer that relies on transistors carefully arranged on the two-dimensional surface of a ceramic wafer to carry out moderately parallel computations extremely rapidly. The person reading this column is a carbon computer that relies on trillions of organic molecules suspended in a 3D semi-conductor saline solution (basically sea water) to carry our computations on an unimaginably parallel scale. The fact that organic computers make themselves is one small testament to their incredible power. Most people don't think of the organic chemistry going on in their bodies as computing, but as you will come to see, it is.

DNA, as we all know, is the stuff of life. For the sake of discussion, imagine DNA as being RAM in your conventional computer. It stores an enormous amount of information about how an organic system should be assembled. The RAM in your computer is read from and written to by the CPU in chunks of bits. DNA, on the other hand, is being read from by thousands of tiny molecules simultaneously. The organic chemistry term for this is transcription. Tiny molecules unzip strands of DNA, read the instructions of a gene to generate an RNA molecule which then breaks away from the DNA strand, floats across the nuclear membrane and gets grabbed by molecules on the other side, which read the strand of RNA to construct a protein. You can think of RNA as the system bus that copies data from RAM to the CPU cache where it can be worked on. A single strand of DNA is usually having genes transcribed into RNA from its surface at thousands of points along it simultaneously.

When a regular computer thinks, it generates some information. When an organic computer thinks, it generates you. What's truly fascinating about organic computing is how this happens. A regular computer program is composed of what are called opcodes, numbers that instruct the CPU to add, subtract, or move some information from one place to another in memory to produce a calculation. RNA is just a list of organic opcodes that instruct the cell's machinery on how to assemble a protein. Proteins are the building blocks and the

computational machinery that all organic systems are made of. Each protein is effectively its own little program that carries out some computational function. Proteins are themselves assembled from lists of amino acids. There are only 21 amino acids that are stitched together to assemble all of the different kinds of proteins in the human body, thus amino acids are the fundamental Legos that we're all made of.

A strand of RNA contains a list of what are called nucleotides. Each group of six nucleotides are interpreted by the cell's protein manufacturing machinery as a 6-bit number (opcode) indexing a 0 to 64 number space. Each nucleotide group instructs the RNA transcription process to add one of the 21 amino acid building blocks to the protein it is constructing. Just like ordinary computers organic computers make errors, and in their case errors can be deadly. The two most common transcription errors for a given amino acid also encode for the correct amino acid. In other words your DNA stores an extra bit with every opcode instruction for error correction during copying ($3 \times 21 = 63 \dots$). What's the unused slot in the number space used for? It's the stop signal that indicates the completion of a protein.

To summarize, you are made of proteins; proteins are little programs that are the computational byproducts of RNA transcription. RNA functions like a system bus, and DNA is RAM that stores everything about YOU as 6-bit sequences of nucleotides. Most organic life is made of out of 21 amino acids because 21 is the number of building blocks that can be efficiently encoded in organic RAM with error correction. You are a giant, walking, talking Lego construction assembled by proteins from trillions of little amino acid building blocks and sea water whose sole purpose is to compute new copies of yourself before the inevitable accumulation of calculation errors causes you to crash permanently. ■

**When a regular
computer thinks,
it generates some
information.
When an organic
computer thinks,
it generates you.**

Create feedback by emailing
TheSaint@cpumag.com.



Alex St. John was one of the founding creators of Microsoft's DirectX technology. He is the subject of the book "Renegades Of The Empire" about the creation of DirectX and Chromeffects, an early effort by Microsoft to create a multimedia browser. Today Alex is President and CEO of WildTangent Inc., a technology company devoted to delivering CD-ROM quality entertainment content over the Web.

Dream Hardware

Your environs may be trying to tell you something. There's that weird, tremulous "ping" noise that gives you the curious urge to say, "Shields." There's Roger Waters' voice crooning about, and indeed from, the wall. Finally, your chandelier spells it all out for you: It's Dream Hardware time.

by Marty Sems

Star Trek Apartment

You know, we all *say* we'd like to have our own transporter rooms, but so few of us ever bother to make one. Interior design genius Tony Alleyne (www.24thcid.com) owes a tremendous debt to "Star Trek: The Next Generation," not only for inspiring his insanely wonderful apartment, but also for generating enough mainstream acceptance of the franchise to entice non-Betazoid women through the door. Alleyne used Velleman digital audio playback modules to provide authentic ST sound effects, plus Vossystems voice-activation gear and loads of AEI Security Systems remote controls. No word on whether he hires a flunky in a red shirt to stage spark-showered deaths at parties. Located in the neutral zone of Hinckley, Leicestershire in the UK, Alleyne recently posted a stellar \$1 million asking price for his unearthly domicile on eBay. Say, wasn't money supposed to disappear by the 24th century?

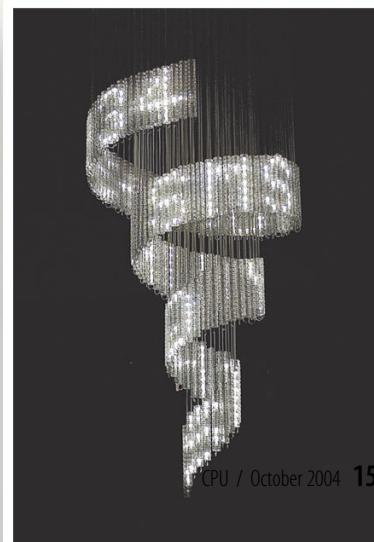


Puren purSonic

Grab a microphone and ensconce yourself in the closet. Time to play the entertaining "This is God speaking" trick on gullible relatives. Puren's purSonic line of soundboards are flat speakers intended for mounting within your walls. Less than a centimeter thick, the purSonics can fill a room with Dolby Surround audio that will leave your dinner guests wondering where it's all coming from. The purSonics have a wider angle of radiation, or cone of sound, than traditional loudspeakers. They obviously don't take up floor space or trail wires everywhere, either. Puren says that a 5.1 system with a receiver, soundboards, and a sub-woofer goes for about \$9,780 (www.pursonic.de/english/e_home.htm). Best to warn your babysitter about your talking walls before she watches any "there's someone in the house" horror movies.

Swarovski Lolita

"The tip of the tongue taking a trip of three steps down the palate to tap, at three, on the teeth. Lo. Lee. Ta." Okay, forget about that book by Nabokov, the one that seems to bewitch redundantly named men and young teachers alike. Instead, think of Lolita as a fantastic chandelier made of Swarovski crystals (www.swarovskisparkles.com/pr.php?pt=pr&d=4&c=8&s=62#). Why is it here? Because Lolita is packed with 1,050 white LEDs that can display messages sent via SMS. Designer Ron Arad envisioned this amazing one-off, and Moritz Waldemeyer did the technical design, assembly, and programming in C. An embedded master processor controls 30 slave chips to address each LED. You can see photos of the building process at www.waldemeyer.com/lolita.htm. Swarovski won't tell us how much its London office will ask for Lolita, which is being offered as part of a limited edition. If the chandelier is true to its namesake, though, its cost should be dear.



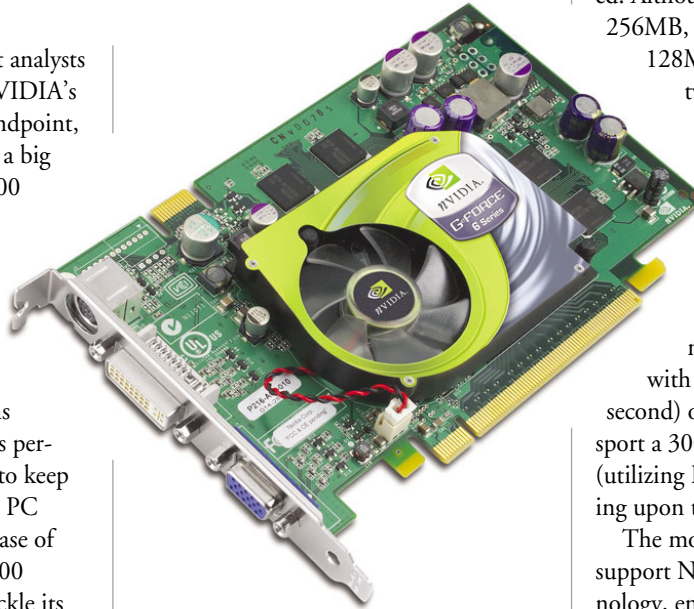
NVIDIA

GeForce 6600 Series

Despite what the Wall Street analysts have been saying about NVIDIA's financials, from a technology standpoint, NVIDIA is back this year and in a big way. NVIDIA's NV40-based 6800 Series of GPUs certainly took the high-end segment by storm. But the high end, along with \$500 price tags, isn't for everyone, which is why the mainstream sectors are so much more important in terms of numbers sold—especially to us perpetually broke gamers who have to keep on forking out money on regular PC updates. With the imminent release of NV43 (to be named GeForce 6600 Series), NVIDIA is hoping to trickle its NV40 goodness down to a more affordable price range in the all-important \$200 sector. The chip itself will be fabbed by TSMC on a low-k 0.11-

micron manufacturing process. Dropping down from 0.13-micron to 0.11-micron for the mainstream is important in keeping the cost down because more chips per wafer can be produced.

Sporting a Native PCI Express interface, NVIDIA isn't currently announcing any AGP versions. And due to the nature of higher power on tap with PCI Express, the 6600s won't require an external power connector. The NV43 core supports all of the NV40's features such as Shader Model 3.0, 32-bit floating point precision, 64-bit texture filtering, and



GeForce 6600/6600 GT

\$149 to \$199

NVIDIA

(408) 486-2000

www.nvidia.com



First Look
PREVIEW

Ultra Shadow II. NVIDIA learned this lesson well with the GeForce4 MX series, and lower-end cards based on the 6600 Series should continue this trend. The only differences are in terms of scaling and levels of parallelism. The 6600 Series is an eight-pipe implementation of NV4x, whereas the 6800 Series is a 16-pipe version of the same technology. The 6600 sports eight pixel pipelines and three vertex shaders, which is half that of the

6800. NVIDIA has performed further trimming where the memory interface is concerned. Instead of staying with the 256-bit memory interface, the 6600 is limited to utilizing a 128-bit interface; hence, memory bandwidth is more limited. Although the 6600 can support up to 256MB, there will likely be a few

128MB versions out there. Thus far, two versions have been penned:

the 6600 GT and 6600, with the GT's core and GDDR3 memory being clocked to 500MHz. Peak memory bandwidth is impressive at 16GBps, as is the peak fill rate, showing more than enough horsepower with 4,000MTps (megatexels per second) on tap. The standard 6600 will sport a 300MHz core clock and memory (utilizing DDR) speeds will vary depending upon the OEMs.

The more beefy 6600 GT will also support NVIDIA's upcoming SLI technology, enabling you to run two boards together in the same system, provided, of course, that you have a motherboard with two PCI Express graphics slots. NVIDIA is working on a dual-PCI Express graphics slot chipset, but it's unlikely to be available anytime soon.

The pricing is set at \$149 for the 6600 and \$199 for the 6600GT, aimed squarely at ATI's RADEON X600 Pro and X600 XT. Expect to see both of these boards to be available in the next couple of months. Benchmarks done at NVIDIA currently have the 6600 GT in the lead over ATI's X600 XT, especially in Doom 3 and in situations where NVIDIA's great memory bandwidth and higher fill rate advantages kick in. Whilst the 6600 Series is full of promise, the slow adoption rate of PCI Express, in part due to the rather lackluster Intel 900 Series platform, could mean that AGP versions would be more widely accepted by the mainstream. If that's the case, then where will this leave the PCI Express versions of the 6600s? Probably on hold until PCI Express becomes more widely adopted. ▲

Due to the nature of higher power on tap
with PCI Express, the 6600s won't require an
external power connector.

Specs: Fabrication process: 0.11-micron grams; Pipelines: 8 pixel pipelines and 3 vertex shaders

by Alex "Sharky" Ross



www.ocztechnology.com

"GOT EB DDR?"

ENHANCED BANDWIDTH



SPECIFICATIONS

PC3200 DDR400 CL 2.5-3-2-8
PC3500 DDR433 CL 2.5-3-2-8
PC3700 DDR466 CL 3-3-2-8

512MB (2x256MB) and 1GB (2x512MB) Dual Channel Kits

Mirrored Platinum Copper Heatspreader
2.8Volts
Lifetime Warranty

DESCRIPTION

Enhanced Bandwidth (EB) technology is a means of increasing memory bandwidth through the optimization of memory latencies for the best possible interaction between the system memory and the chipset and memory controller. It uses low tRP and tRCD latencies in combination with a Variable Early Read Command to allow for the highest possible effective data bandwidth. In most applications, the 2.5-3-2 (CL-tRP-tRCD) will deliver bandwidth that is indistinguishable from CL-2 modules.



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ATACOM.com

atacom.com

eXcaliberPC.com

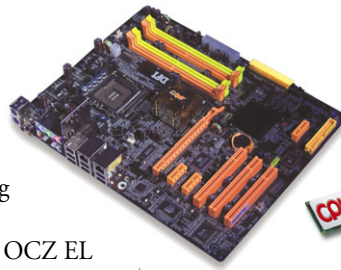
excaliberpc.com

DFI 875P-T

Mark your calendars: DFI has a mobo industry first. The 875P-T is in almost every way a Canterwood board, but DFI is the only vendor thus far to pair Intel's 875P chipset with Socket T (775). This way, if you want the speed of Intel's latest chips but also want to preserve your investment in high-end DDR and AGP products, the 875P-T has you covered.

Of course, you may miss 7.1 audio, Matrix RAID, and some other perks of Intel's 900-series chipsets, and I wish DFI had gone with Intel's CSA-based GbE chip rather than Marvell's 32-bit, PCI-based 88E8001 chip. But you still get a slew of DFI extras, including the FrontX bay device, which now includes mini-FireWire, SPDIF out, and external SATA connectors. DFI uses the ICH5R southbridge, so you get SATA RAID 0/1.

At first, I was stoked about the BIOS' Easy Over-Clocking feature, which provides presets such as 5%, 10%. However, when applying these to my test configuration (3.6GHz 775-pin P4, 1GB of OCZ EL PC4200 DDR, NVIDIA 5950, 200GB WD, WinXP SP1), the highest stable setting was 7.5% (215MHz). When I over-clocked manually, bumping up CPU and DIMM voltages to 1.5V and 3.05V, respectively, I peaked out at 4.05GHz (225MHz FSB). Note, though, that my 3DMark03 score at this speed was 6220 vs. the 6816 obtained with an Easy Over-Clocking score of 7.5%. I might have been able to goose the board further with higher CPU voltages, but with diminishing performance accompanying higher settings, it didn't seem worth the risk. Time will tell if the 3.6GHz chip has a low overclocking ceiling.



875P-T
\$220
DFI
(510) 274-8000
www.dfi.com



Other benchmarks obtained at default board settings and 1,024 x 768 resolution included: 59.5fps for Doom 3 demo1 at high detail; 6734 for 3DMark03; 113.708 for X2; 52.45 for AquaMark3 at no AA/AF; 64.07 for Comanche 4 with no audio; 5563 System score for PCMark04; and 2:14 (minutes:seconds) for a WinAce 200MB folder. These numbers range from average to good on graphics, but the PCMark04 and WinAce scores are stellar, showing that the 875P-T may excel best where it is least appreciated: productivity apps.

I know DFI wants this to be a LAN party favorite. Honestly, I'd rather make it the cornerstone of a home network. ▲

Specs: Socket 775, 4 DDR266/333/400 (with ECC), Intel 875P + ICH5R, 2 SATA, 2 PATA, 1 AGP 8X, 4 PCI, optical and coax SPDIF, 4 USB plus 1 USB header, 1 FireWire plus 1 FireWire header

by William Van Winkle

Niro 400

Is \$450 a fair price for a PC/home theater surround-sound system that probably rates about seven out of 10 in the consumer-class fidelity scale? No. Is \$450 a fair price for the world's first reasonably portable, very-good-quality surround speaker set? I think so.

Niro builds the center and four satellites into a 2.9-pound single polygonal unit measuring 2.6 inches high x 7.9 inches wide x 5.3 inches deep. Niro also sent the optional \$20 kit for mounting the main speakers on top of a flat panel.

Five 2-inch cones in the main unit fire in your face, at an angle, and sideways. The 5-inch cone sub measures only 8.7 x 12.6 x 5.1 inches. So long as you keep the sub against a wall, the 6.6-pound box sounds incredibly strong. And compare: Niro's sub specs at 40W rms vs., say, Creative's Inspire GD580 sub at 17W rms. Best of all, the main and sub speakers each



connect to the Dolby Digital/DTS/Pro Logic II decoder/amplifier via one thin connection. This makes setup a snap, renders the set very easy to move, and eliminates the cable clutter that dogs every other 5.1 speaker set out there. The amp features two Toslink, one coax, and one set of analog inputs, as well as a remote.

We tested the Niro 400 with a range of music, Doom 3, and the DTS movies "The Bourne Identity" (Paris chase scene) and "Master And Commander" (opening battle scene). Cranked to nearly its maximum setting, the sub doesn't roar, but Niro achieves remarkable lows for such a

Niro 400

\$450
niro1.com USA
(800) 533-5617
www.niro1.com



svelte box and, perhaps more importantly, keeps the bass very clean and sharp. Center channel clarity for dialog was particularly impressive, and the highs are excellent, although midrange performance in music is a bit flat. Doom 3 would only play in stereo, most likely because of a conflict between 5.1 output from the application and Niro's built-in decoding.

We'd ballpark the Niro 400's surround performance at about 270 degrees when used in a narrow environment with nearby walls and about 200 degrees in the open.

Technologically, the Niro 400 is stunning. For cramped environments or mobile use, nothing else on the market can compare. Just remember to appreciate it for what it is, not the similarly priced sets it could compare against. ▲

Specs: Amplifier: 2.2 x 7.9 x 11.7 inches, 2.9 pounds, five 2-inch cones, rms 24Wx5, rms 40Wx1 to sub; Speaker unit: 5 2-inch cones, 2.6 x 7.9 x 5.3 inches, 2.9 pounds; Sub: 1 5-inch cone, 8.7 x 12.6 x 5.1 inches, 6.6 pounds

by William Van Winkle

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

Diskology Disk Jockey

Diskology's Disk Jockey is a dream come true for any PC hobbyist or technician who lives over a test bench or is always swapping hard drives in and out of machines. Roughly the size of a black-board eraser, the DJ sports two 40-pin IDE connectors, an included AC adapter, and USB 2.0 and FireWire ports.

At first, I was only interested in the DJ for its cloning capability. I cloned a WD 80GB drive to a 200GB drive in 33:18 (minutes:seconds)—notably better than the 40 minutes Diskology told me to expect. All I did was connect the two drives (each jumpered as a master), power up the brick, and then hit the power button. The DJ's Achilles heel is its LED status indicator system, and I ended up going on faith that it was working. I then dropped the 200GB



drive into a Windows XP system and used Windows to create and format the remaining 120GB into a usable partition. Observe that no PC was involved.

If you're worried about data integrity, turn the DJ's mode dial to Verification to ensure that the data on Disk 1 matches that on Disk 2. There are two erasure modes, one for single-pass and one for NSA specification triple-pass wiping.

Specs: 1.65 inches high x 2.5 inches wide x 5.6 inches high, 1.1 pounds, 1 USB type B, 2 FireWire 6-pin, OS support: Windows 98SE/Me/2000/XP and Mac OS 9.1 and higher

Disk Jockey

\$329

Diskology

(916) 645-3196

www.diskology.com



But wait; there's more: Connect the DJ to your PC via USB or FireWire, and you can have instant, enclosure-less external hard drives. With two drives, you can switch to Mirroring mode, essentially RAID 1. Alternatively, Spanning mode lets you have two drives connected to the DJ appear in Windows as a single large drive.

Immensely handy and OS platform-agnostic, the DJ is a must-have for anyone who has earned their hand scars inside computer chassis. Also keep an eye out for Diskology's forthcoming Disk Junk utility for using the DJ to upgrade TiVos. ▲

by William Van Winkle

AOpen EX915

If you're going to compete in the SFF space, somehow, some way, you must beat Shuttle. AOpen's new EX915 squares off against Shuttle's SB81P with the same 915G chipset at the same price. The EX915 is smaller and considerably easier to build. The shrouded, side-blowing CPU heatsink assembly uses a 70mm fan blowing through copper fins shot through with four copper heat pipes. The power supply is a four-phase, 275W unit that, while below Intel's recommended specs for a PCI Express graphics-enabled system, proved more than adequate for a stocked box thanks to AOpen's solid engineering. When idling, the EX915 is dead silent.

On performance, the EX915 performs roughly on par with other 915G configurations. Running with only a P4 520 (3GHz) and 512MB of Corsair PC3200 TwinX in dual-channel mode, my EX915 hit a 1339 3DMark03 score with default

settings, whereas the Shuttle SB81P I reviewed last month hit 1314 with significantly stronger components. Compared against Shuttle's ST61G4 based on ATI's 9100 IGP chipset running a 3GHz P4 Northwood, the EX915 scored 3878 in PCMark04 vs. the ST61G4's 3735.

While I prefer the curved, faux metal grille fascia over AOpen's prior generation XC Cube "toaster" look, the interior design shows remarkably little innovation. You get a removable drive cage that holds both external drives (one 5.25 inch; one 3.5 inch) and has a 90-degree rotated HDD cage that slides onto the cage's bottom. Cable management is fair, but you'll need to supply your own Molex splitter if you plan on using a high-end x16 graphics card.



EX915

\$399

AOpen

(888) 972-6736

usa.aopen.com



AOpen does a good job stocking the front and back with I/O ports but backs some of them with the wrong compo-

nents. AOpen ditches Intel's excellent Gigabit LAN and HD Audio functionality and instead uses a gimpy Broadcom GbE chip tied to the PCI bus and Realtek's outdated 5.1 ALC655 audio chip. There are four SATA connectors on the motherboard but only one internal drive bay and no RAID support. Go figure.

The EX915's heatsink does get noisy under a heavy load, and there is almost no provision for overclocking, but my system did prove stable. The EX915 is no headline grabber and doesn't quite earn its price tag, but it's still a respectable SFF box. ▲

by William Van Winkle

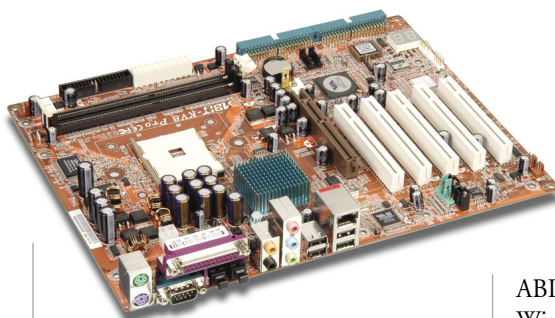
Specs: LGA775 socket, 2GB max PC3200 DDR, Intel 915G/ICH6, 5.1 Realtek audio, PCI GbE LAN, 4 SATA headers, 1 PATA header, 1 5.25-inch bay, 1 3.5-inch bay, 1 x16 PCIe, 1 PCI, 4 USB 2.0, 3 FireWire, and optical and coax SPDIF

CPU Ranking: 0 = Absolutely Worthless 1 2 3 4 5 = Absolutely Perfect

ABIT KV8 Pro

Based on VIA's new K8T800Pro chipset, ABIT's OC-friendly KV8 Pro has a few shortcomings, such as the lack of Azalia support (which the K8T800Pro allows) and only a PCI-based Gigabit Ethernet solution. However, this board is optimized for tweak freaks and priced at a deliciously low \$100. You still get RAID 0, 1, and JBOD to the two SATA ports, and ABIT now adds AGP and PCI bus locks to ensure stable overclocking.

We tested our KV8 Pro with a 754-pin Athlon 64 3200+ running 1GB of OCZ EL PC4200 memory, NVIDIA GeForce FX 5950, 250GB Hitachi SATA drive, and Windows XP SP1. Running all tests at 1,024 x 768 with no filtering, we saw the following: 60.5 for DOOM 3 demo1 at high detail, 6285 for 3DMark03, 69.06 for



Comanche 4 with no audio, and a 4075 System score for PCMark04. For a 3200+, these are sweet numbers. In comparison, similar configurations we've seen based on the nForce3 250 were hitting 3DMark03 scores around 6180, Comanche 4 at 65.80, and PCMark04 at roughly 4040. Now recall ABIT's price tag.

The KV8 Pro is rife with BIOS overclocking features, encompassing everything from northbridge and southbridge voltage control to management of the five fan headers on the board. We also dig

KV8 Pro

\$100

ABIT

(510) 623-0500

www.abit-usa.com



ABIT's uGuru overclocking processor and Windows client. Unfortunately, we didn't have a 2800+ or 3000+ chip on hand, reputed to be AMD's finest for overclocking up to about 250MHz. As it was, the highest stable configuration we achieved was 223MHz (3DMark03: 6372). Pushing higher than this ultimately corrupted our Windows installation and necessitated reimaging the drive.

When you compare bang for the buck, it's obvious that the 754-pin platform still has the ability to trounce the newer 939-pin design. This situation won't last forever, but if you're an Athlon enthusiast on a budget, the KV8 Pro is your saving grace. ▲

Specs: Socket 754 for Athlon 64, 2 DDR266/333/400 (2GB max.), VIA K8T800Pro/NT8237, 2 SATA, 2 PATA, 1 AGP 8X, 5 PCI, optical SPDIF in/out, 2 USB plus 2 USB headers

by William Van Winkle

Cooler Master CoolDrive 6

Cooler Master's CoolDrive 6 (the concurrently developed 5 model will be released in the retro Musketeer line) is an elegant looking aluminum device sleek enough nearly to deserve being an external enclosure but for the mess of wires trailing out of the back. In a nutshell, the CoolDrive 6 is a 5.25-inch bay frame with an integrated, silent 40mm fan, rubber screw grommets, four fan connectors, and four temperature leads. The silver front bezel features a blue-lit LED screen flanked by an ovoid array of six navigation buttons, and the screen displays probe temperatures and fan speeds.

I built a 3.2GHz Pentium 4 system with a 7,200rpm WD2000 (Western Digital 200GB) hard drive in a Cooler Master Cavalier 2 desktop case for testing. Hoping to create something of an average environment, I enabled the two case fans at the rear of the case but not the side fan closer to the hard drives.

In my first set of tests, I mounted the hard drive outside of the CoolDrive 6 in a regular 3.5-inch internal bay and taped sensors onto the top center of the drive and in the middle of the circuit board on the bottom. I took readings off the scrolling LED display in an idle state, as well as near the end of running PCMark04's hard drive tests three consecutive times.

Outside of the CoolDrive 6, the temp at the top of my drive measured 95 degrees Fahrenheit during idle, while the bottom hit 135 F. These figures jumped to 100 F and 153 F during heavy use. When installed within the CoolDrive 6, the idle numbers dropped to 93 F and 115 F. Under load, the enclosed drive showed 93 F and 126 F. As you can see, CoolDrive 6's cooling benefits are considerable.



CoolDrive 6

\$65

Cooler Master

(510) 770-8566

www.coolermaster.com



The unit's downfall in my testing was the CoolDrive 6's Windows software, which requires an initial installation of the .NET framework. I received an unmarked disc with my test unit, which did not include the requisite USB driver. Apparently, the file isn't available this side of Taiwan as of this writing, so we could only gaze longingly at a dead UI, which, for the record, can only be minimized or exited from the System Tray. Also, while the CoolDrive 6's bezel looks amazing, I found it exceptionally unintuitive to navigate and customize.

Bottom line: The CoolDrive 6 delivers great disk cooling and sweet looks, but it is potentially problematic once you get past its main function. ▲

by William Van Winkle

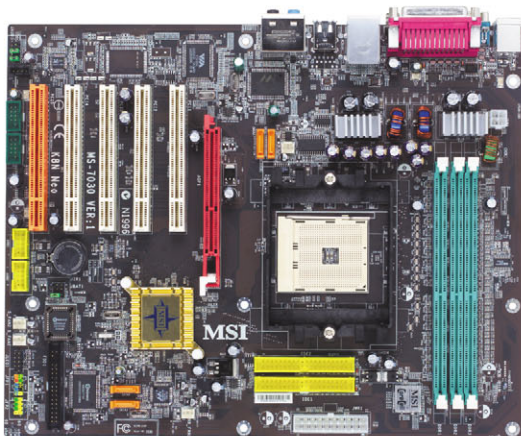
Specs: 1.7 inches high x 5.9 inches wide x 8.2 inches deep; fan: 4.4cm; enclosure: aluminum; 4 temp probes; 4 fan sensors; standard Molex power input

CPU Ranking: 0 = Absolutely Worthless 2.5 = Absolutely Average 5 = Absolutely Perfect

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- vr-zone.com



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- Anandtech.com



"It's easy to see that the MSI K8N Neo-FIS2R Platinum is a winner. It outperforms the most popular socket-754 boards on the market."
- GamerDepot.com



"The MSI K8N Neo-FIS2R Platinum is an excellent board to work with the performance of the MSI K8N Neo-FIS2R Platinum motherboard was excellent. It's easily the fastest Athlon64 board we've tested to date."
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- HardOCP.com

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AMD Tries Again with Sempron



Anand Lal Shimpi has turned a fledgling personal page on *GeoCities.com* into one of the world's most visited and trusted PC hardware sites. Anand started his site in 1997 at just 14 years old and has since been featured in *USA Today*, *CBS' 48 Hours* and *Fortune*. His site—www.anandtech.com—receives more than 55 million page views and is read by more than 2 million readers per month.

Back when AMD launched the Duron in the summer of 2000, the word value didn't have to mean slow. The first Durons to hit the streets were almost as fast as their equivalently clocked Athlon brethren, with a much lower price tag. Just nine days after AMD's Duron was released, NVIDIA continued the trend of affordable computing with the release of the GeForce2 MX, an affordable GPU that offered performance close to that of the flagship parts out at the time.

The demise of both the Duron and the MX line, although the latter has been far more successful thanks to NVIDIA's sales and marketing teams, has been that the designs remain fairly crippled as time goes on. Although the Duron and GeForce2 MX were quite competitive with the more expensive members of their families when they were released, the faster chips just got faster while the value line fell further to the bottom. Value no longer meant slow; it no longer applied. The same became true across the board from all manufacturers: Intel's Celeron went from being an overclocker's dream chip to the laughingstock of performance.

In AMD's case, it pretty much let the Duron die. AMD was discounting its Socket-A Athlons so much that it didn't make sense to buy a Duron because you would end up saving around \$20 or \$30 and would get significantly lower performance. A lack of value basically killed Duron in both the enthusiast and retail market segments. It wasn't really until the release of the Athlon 64 that AMD could once again establish their flagship line of CPUs as being worth more than the rock-bottom prices at which they were selling Athlon XPs.

With Athlon 64 AMD priced its chips competitively with Intel; and although AMD's CPUs were still cheaper, it wasn't selling A64s at bargain-basement prices as was the case with the Athlon and Athlon XP. A higher priced Athlon 64 paved the way for a reintroduction of a value processor, but since the Duron name had already faded away thanks to nonuse, AMD chose a new moniker: Sempron.

Sempron is a brand that includes three architectures: Socket-A, Socket-754, and Socket-939. The first Semprons launched were only available in Socket-A and Socket-754 flavors, but a Socket-939 version will be released in 2005.

The Socket-A Sempron is basically an Athlon XP: a 0.13-micron Thoroughbred-B based Athlon XP. The chip is architecturally identical to the Athlon XP, with a 256KB L2 cache and a 333MHz FSB. The Socket-A Semprons range in model number from a 2200+ up to a 2800+. Note that these ratings are actually more aggressive than Athlon XP ratings, as AMD only used business/content creation tests to determine the rating and left out gaming and workstation applications from the mix. What this means is that a Sempron 2800+ will be slower than an Athlon XP 2800+, in fact it's closer in performance to an Athlon XP 2600+.

... Intel's Celeron went from being an overclocker's dream chip to the laughingstock of performance.

The Socket-754 Sempron is far more interesting, as it is basically an Athlon 64 without 64-bit extensions and with only a 256KB L2 cache. But the on-die memory controller helps keep performance competitive.

Once again, the Socket-754 Semprons are rated more aggressively and thus, although the Athlon 64 2800+ and the Sempron 3100+ both run at

1.8GHz, the Sempron is rated higher (even though the Athlon 64 2800+ is faster). The reason behind the aggressive ratings is to facilitate comparisons between the Sempron and Intel's latest Celeron D.

So how does it perform? The Socket-754 (K8) Sempron, currently only available as a 3100+ running at 1.8GHz, is quite reminiscent of the old Durons. It offers performance very close to the more expensive Athlon 64s at a lower price, but what's even more important to realize is that since it is compatible with Socket-754 motherboards, your upgrade path is pretty much guaranteed to be a good one. A Sempron 3100+ today, and an Athlon 64 3700+ tomorrow—not a bad deal if you ask me. ■

Talk back to Anand@cpumag.com.

by Alex "Sharky" Ross

A Far Cry From What I Hoped For. . . .

Whilst we're all sitting here and waiting for Half-Life 2, the only game worth replaying for me has been CryTek's Far Cry. Recently, Ubisoft issued a second patch for the game (dubbed v1.2), which was much needed. (NOTE: At press time, Ubisoft did, in fact, pull the patch I tested [although it's available if you look hard enough]. A new and "improved" one should be out by the time you read this. The word is it will have better optimizations for ATI cards, as well.) Slower systems with older boards ran the game pitifully, but to have current generation boards/systems struggle at times was obviously unacceptable. The 1.2 patch was issued to boost the run speed by up to 15% and run duration by 30%. No complaints there, obviously. But what really tickled my fancy is the Shader Model 3.0 path now available with the patch. Pixel Shader 3.0 and Vertex Shader 3.0 rendering spruces up the performance even more, of course only if you have an NVIDIA 6800 series video card. (X800 does not fully support SM 3.0.) A point well worth underlining is that visually you will not be able to tell the difference between an X800 running Far Cry in the SM 2.0 path over a 6800 running the SM 3.0 path.

Incidentally, even though we have yet to hear an official release date for Half-Life 2, Doom 3 is being released as we go to press (for more on Doom 3, see Kyle's column on page 24 and Samit's review on page 93). According to Kyle's tests on HardOCP, NVIDIA's GeForce 6800 Ultra outperforms ATI's Radeon X800XT PE by a considerable margin. First up, PS 3.0 allows for single-pass per-pixel lighting instead of having to do multiple passes under PS 2.0. Heavily lit scenes obviously benefit in terms of performance with a GeForce 6800. According to CryTek, the VS 3.0 and its instancing helps to reduce the CPU and bus loads and does actually aid performance, especially with all of the greenery in the game. Having run some of my own benchmarks under different levels, the enhancements with this patch do

change the picture, so to speak. Beforehand, ATI was in the lead, but when deployed, the patch propels NVIDIA into the lead over ATI under Far Cry, especially when you factor in 4X AA and 8X AF. In general, there's roughly a 6% to 10% performance boost, which isn't as much as I was hoping to get. I was also hoping for more magic sauce to come from SM 3.0, but granted, it's early days for that.

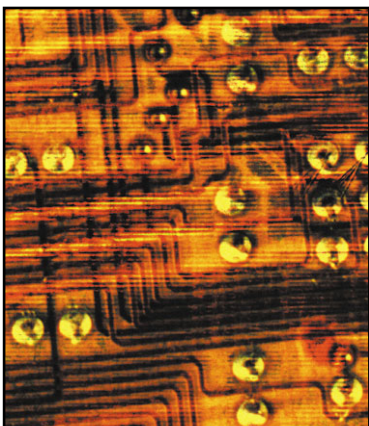
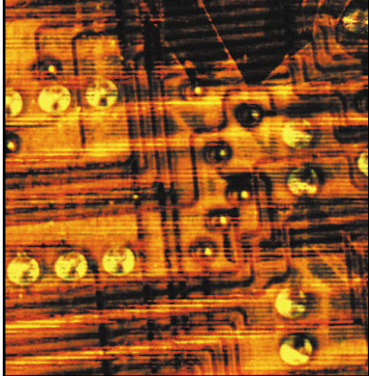
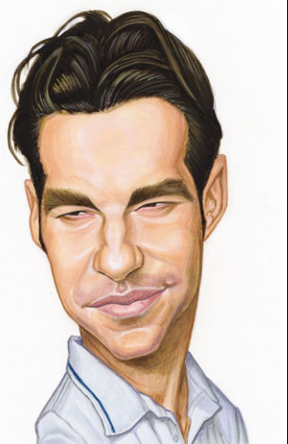
Ubisoft provides a full rundown of the differences and advancements made with the patch, but needless to say, because it's free if you already own the game, then just go ahead and download it. Even if you don't have a GeForce 6800 card, any PS 2.0-capable card will perform slightly better with this patch enabled than before. And with so many gamers pulling their hair out due to the sluggish performance prior to this patch, this can only help. Think of it as how the game should have shipped originally.

Next up is Doom 3. Other than Half-Life 2, Doom 3 is the game I'm sure you've all been waiting for, and having seen it in action a few times, I know you won't be disappointed when it comes to eye candy. The engine is truly next-generation and will push your 3D cards hard. Perhaps what you don't yet know is that NVIDIA will also be in the lead here. Traditionally, the company has always been strong under OpenGL, and with Doom 3, you can expect the performance of the GeForce 6800 series to be considerably better than ATI's X800. According to Kyle's in-house tests, the 6800 series was considerably faster than anything ATI has to offer. It looks like to play Doom 3 in its best quality settings, you will really require a 16 pipe card (the 12 pipe X800 had a rather poor showing). ■

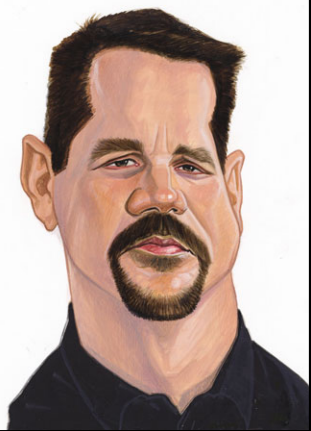
Email me your PS 2.0/3.0 optimizations at sharky@cpumag.com and I'll patch them in for you.

... with so many gamers pulling their hair out due to the sluggish performance prior to this patch, this can only help.

Disrupting Reuters' newswire with a cheery Christmas greeting at age six, Alex "Sharky" Ross became an avid computer user/abuser, eventually founding popular hardware testing/review Web site SharkyExtreme.com. Exposing shoddy manufacturing practices and rubbish-spouting marketing weasels while championing innovative products, illuminating new technology, and pioneering real-world testing methods was just a front for playing with the best toys. The site acquired, he left in 2001. A London native and London School of Economics graduate, Alex currently overlocks/tunes Porsche 996 Turbos with Akkurat PGI when he's not tweaking PCs.



We're All DOOMed



Kyle Bennett is editor-in-chief of HardOCP.com (hardocp.com), one of the largest and most outspoken PC-enthusiast sites on the Web. HardOCP.com is geared toward users with a passion for PCs and those who want to get cutting-edge performance from their systems. Beware, though, Kyle is known for his strong opinions and stating them in a no-nonsense manner while delivering some of the most in-depth reviews and PC hardware news on the 'Net.

I'm not a game critic, but I may act like one a bit today. I won't get into a full review of id Software's Doom 3, except to say that it kicked large amounts of ass using totally new cutting-edge technology while staying true to the game's roots. If you played Doom or Doom 2, you'll be right at home with this Doom in a new wrapper. The experience was one that got my adrenaline racing and left me wanting more.

As games go, I think this year has already shaped up to be pretty hearty. Far Cry, Battlefield Vietnam, UT2K4, and Doom 3 have already blessed us. And there are a few others coming, like Half-Life 2 (hopefully gold by the time you read this) and S.T.A.L.K.E.R. next year, which are sure to deliver some great interactive entertainment.

After all, isn't gaming why we build and tweak our boxes? I know some of you are just in that tweak-monkey phase where an extra 10 points in your favorite synthetic benchmark will mean the difference between having a good day and having a bad one, but once you get beyond that aspect of being a computer geek, you come full circle to see again why we are here in the first place, and that is playing games. Sure there are plenty of other things we can do with our PCs, but for most of us, the awesome tower of power was put under our desks to give us some sort of gaming advantage.

Being a hardware or gaming geek gives many of us a peek into the future of what entertainment is going to be all about. About five years ago I was quoted as saying id Software will be one of the companies that bring us into virtual-reality environments. And while Doom 3 doesn't exactly make that jump yet, it can certainly paint a reality built out of pixels that can give someone with a little of bit of imagination for how things might work out in terms of VR. Those of you geeks that have built hard-core gaming boxes that are pumping out resolutions of 1,600 x 1,200 while running solid levels of antialiasing and anisotropic filtering know

exactly what I am talking about. I can just "hang out" in some of the Far Cry and Doom 3 levels and check things out around me, awestruck with what exactly I am seeing and interacting with. Trust me, that guy on the three-year-old HP box isn't having the same tangible gaming experience as you are.

Of course there are those detractors out there that will tell you all the money you dump into your PC is wasted, as it becomes "old" in six months. Those are the same people that weren't allowed to have colored markers when they were kids. They think that Q*bert still rocks and an electric pencil sharpener is a marvel of engineering. Anyway. . . .

While being a cutting-edge gamer and computer hardware type of guy has its rewards, it has its responsibilities, as well. While you are taking some of the first looks into interactive environments never before seen and you are being a leading man in the action flick that so many others are just sitting around watching, you are also helping to shape the future of the world. Had the geeks out there not given such support to the past virtual worlds we have seen, we certainly would not be seeing the ones we are seeing today. Do

you think we would be seeing Half-Life 2 or Doom 3 today if we had all sent John Carmack hate mail for making Castle Wolfenstein 3D? Heck no. (Although, if that had happened he probably would have already been into space by now—maybe not a self-funded project, though.)

What I am getting at here is that us hardware geeks and game freaks are shaping the world around our wants and needs, at least in terms of entertainment. Sure there will be the "chick flick" virtual-reality simulator one day, but bet your bottom dollar that we will get to kill some demons, aliens, and just some plain old bad guys first. ■

Being a hardware or gaming geek gives many of us a peek into the future of what entertainment is going to be all about.

You can talk with Kyle at kyle@cpumag.com.

PC Modder

Tips & Tutorials

Modding does the body good. A PC's body anyway, inside and out. Here you'll find hardware, firmware, tools, tips, and tutorials for modding your rig's performance and appearance. Send us your own mod-related tips and ideas at modding@cpumag.com.

Modding enthusiasts have a penchant for the latest toys. Fast processors, powerful video cards, silent SFF enclosures, and radically lit motherboards are all fair game when it comes to a modder's creative mind. Recognizing the appeal of unconventional customization, an entire industry has emerged to support the community.

Mods & Ends

Thermaltake A1845 Hardcano 12

When you modify a car for maximum performance, it's important to monitor certain parameters. For example, extra boost through a turbocharger stresses the car's engine, often necessitating some preventative maintenance. Thermaltake's Hardcano 12 (\$60) is designed to serve a similar purpose, simultaneously keeping tabs on up to four fan speeds and four temperatures. Thermaltake even includes the fan-speed connectors and thermal probes for simplified installation.

And then there's the Hardcano 12's aesthetic value. From the front it looks like a car stereo head unit with blue backlit lighting and control pad. You can control fan speeds automatically according to

corresponding thermal readings or manually in small increments using the controls. A built-in alarm sounds if one of the fans should fail. It will also trip if thermal readings exceed any of four available presets from 40 to 70 degrees Celsius. At the very least, the Hardcano 12 serves a valuable purpose: monitoring stressed components. Fortunately, it looks good in the process.

Corsair Twin2X1024-5400C4Pro DDR2 Memory Kit

Intel's 925X platform doesn't boast a spectacular increase in performance, and it certainly doesn't suggest an attractive value. However, between its DDR2 memory support and PCI Express graphics interface, it does represent the very latest technology. And while high-end PCI Express graphics cards are still rarer than rubies, you might have an easier time landing DDR2 memory modules. In fact, Corsair made its 533MHz DDR2 modules available shortly after Intel's LGA775 processor launch. Although they are officially specified to transfer up to 4.2GBps of bandwidth, latency causes the faster modules to perform roughly on par with DDR400.

However, Corsair's new 667MHz modules promise to infuse cooperative 925X motherboards with some extra FSB firepower. The TwinX kit ships with a matched pair of 512MB modules tested to run at 667MHz on an Intel-based board. They can't improve latencies, but the CAS4 modules still deliver better memory performance on an overclocked platform. Expect to pay about \$400 for the 1GB kit.



Thermaltake's Hardcano 12 fits in an available 5.25-inch drive bay.

Black & Decker Mouse Sander/Polisher

When it comes to down-and-dirty modding, you simply can't do without some tools. The Dremel, for example, is a boon to any cutting, grinding, or polishing job. Then there's the hole saw, perfect for drilling perfectly circular holes for mounting fans. Black & Decker's Mouse (\$45) is another useful implement.

Beyond its obvious utility around the house, the Mouse features a Velcro-like base to which precut sanding pads are applied. There's also a finger attachment for light detail work (not for deburring metal edges), and several types of sanding-polishing pads are included.

Fashionably Fresh Firmware

Plextor PX-712A & PX-712SA

Version 1.03 adds support for reading dual-layer DVD+R media, plus improves initialization of DVD-R and DVD+RW media.

www.plextor.com/english/support/downloads/firm_712.htm

Rockbox Jukebox Firmware

The Rockbox firmware is a replacement for the factory Archos 5000, 6000, Studio, Recorder, FM Recorder, and Recorder V2 software.

rockbox.haxx.se

Nikon D70 Outfit Firmware Update

Nikon fixed several bugs with this firmware update, including a vignetting issue at high shutter speeds. It also adds support for CF cards in excess of 4GB.

www.nikonusa.com/template.php?goingto=dtc_options&cat=1&grp=2&productNr=25214

EMU 1820M Digital Audio System Firmware

The EMU 1820M firmware update addresses four bugs related to headphone output quality and the Audio Dock. There's also a new driver that fixes a handful of issues.

www.emu.com/support/files/download2.asp?Centric=759&Platform=1

by Chris Angelini

Building "Spike"

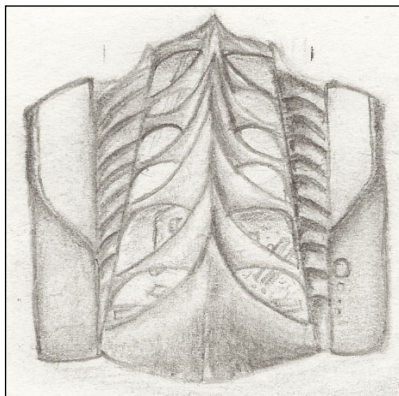
The Diary Of A Modder's Creation, The Finale

In July's CPU (page 31) we began following the progress of "Spike," a modded system that Gareth Powell created from scratch. In August's issue (page 31), Gareth started assembling Spike, and in September's issue (page 27), he finished the paint job and was set to complete the assembly until he ran into some unexpected problems. This month, Gareth brings the project to an end.

Last month I was on the verge of failure. I was hopelessly past deadline and rapidly running out of time. The spikes that I had asked a local armour smith to create ended up looking nothing like what I had envisioned. Therefore, I had no choice but to roll up my sleeves and finish the spikes myself. I have some metal-fabrication experience but not nearly enough to fabricate the parts the way I needed. Even more daunting was finding a place to build the spikes because I did not have the tools I needed. But you have to walk before you can run, so I focused on finding a place to build the spikes before worrying about anything else.

As luck would have it, the guys at Primo Customs came through for me again, letting me have full access to their shop and tools. Better yet, Rick Primo gave me a hand with the more difficult tasks I needed to complete before the design could come to life. The most daunting task in this build was the aluminum welding, a craft that takes years to master. Rick decided it was best for him to do the welding with me assisting, due to the fact that this isn't something you can learn in a few days.

The first thing I had to do was make a template for the spikes. Most important was the master spike, which is the anchor point for the rest of the spike assembly. It was crucial to get this right. I first created



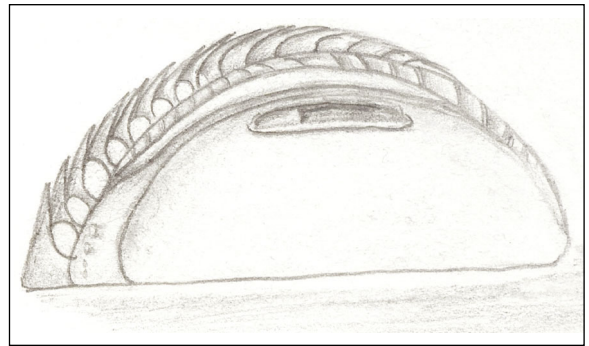
After months of planning and hundreds of hours of work, setbacks, and readjustments, here you see a look at the finished Spike. The sketch to the left is what Gareth envisioned the project would look like before starting the actual mod.



This image gives you a look at the brushed-swirl polishing technique Gareth used on the inside of the case, plus the arrangement of the hardware.



The \$1,000 paint-job on the side panels of Spike, complete with a special red mix, really makes the system stand out and gives it a sense of depth next to the spikes.



This preliminary sketch shows what Gareth had in mind early on for the side panels and the spikes running along the top.

some templates out of cardboard and started to experiment with the shape and size of the master spike. Soon I had what I wanted. I had to next figure out how to make the damn thing. Rick was very helpful during this phase, and through his years of experience with working with metal, he came up with the idea of making the single spike in two halves so that the compound curves that were needed to form the shape could be easily pounded out. The two halves could then be matched and welded together. This would also allow for adjustments in the size of the spike if needed. It was a lot more work, but in the end it was a more practical solution. We went ahead with this method, and I went on to template the rest of the spikes.

Welding & More Welding

To save time in the face of a deadline, I decided to use the same template for the nine

spikes that make up the majority of the assembly. The best way to do this was to scan the template into a computer and print them out on a plotter so that I could stick the vinyl decal directly on the metal and cut around them. Primo Customs does a lot of graphics, so it has a very nice plotter on hand. This process didn't take that long at all.

The metal I used for the spikes was 0.090-zero-temper 6160 aluminum. 6160-grade aluminum is better known as billet aluminum. Even though it's a soft metal, cutting it isn't that easy. The type and thickness of the metal makes it too much for a Dremel or jigsaw, and the shape made it too hard to cut with a band saw or plasma cutter. I had to get inventive. Even though a scroll saw isn't meant to cut metal like this, I decided to give it a try. To my surprise, it worked quite well. The only problem was time. It was taking me about 90 minutes to cut the two halves of a

spike, and I was breaking blades on a regular basis, even though I was using liberal amounts of aluminum cutting oil. Despite the fact that the scroll saw was working, I didn't have the time to slowly cut the spikes out. I had to find a faster solution.

Salvation came in the form of an air nibbler. This metal-eating beast of a tool is capable of chewing through 18-gauge hardened steel, and it had little problem following the radius of the curves, but I still got all 20 half-spikes cut out in just under two hours. After the nibbler did its thing, it was time to clean up the parts using a grinding station. I decided it would be best to grind the spikes into matching pairs. This way they would mirror each other.

After shaping and sizing the spike halves, I needed to pound them into shape. The aluminum was easy to shape using the

right tools. I used a selection of mallets and a leather-panel beater bag to pound the metal into the right shape and radius. I then matched the halves side-by-side and tack-welded them in place on the frame.

With the two sides matched up and in place, I welded them together. I then removed them from the frame so that I could grind the weld down so the two-part look would appear as one. Having 10 spikes with welds to grind took a considerable amount of time. I hit each spike with a special aluminum-grinding disk to get the height of the weld down. I then used a flap disc to blend the weld into the existing metal. Finally, I used a Scotch-Brite disc to clean up any discolorations. I repeated this process on every spike, including the rear spike, which was sized slightly larger than the others. With all the welds ground down, it was time to weld the individual spikes into one unit.

I foam-taped the 10 spikes to the frame in the predetermined order. After some final bending and shaping, the spike assembly was ready to weld together. The actual welding took no more than half an hour, but I still had plenty of grinding and blending to do to make the 20 welds disappear. Overall, there are close to 50 welds for this case—even more if you factor in the redos and touch-ups that were needed.

But after 30 hours of work, I finally had the metal work I was looking for.

The Pressure Is On

Early on in the building of the spikes, I decided against polishing the assembly. Not only would it take around 50 hours I didn't have, the stress placed on the material during the process would more than likely deform the shape. I really wanted to polish the assembly, but it was becoming more and more apparent that an alternative finish was needed. I took some time to research different aluminum finishes and decided to give the assembly a brushed-swirl effect. This is done using a 3-inch Scotch-Brite disc and letting the disc swirl and move around. Using different angles and pressures, along with a bit of creativity, I gave the assembly a finish that had depth and, in essence, a little bit of an organic look. The finish really started to give the piece a skeletal feel. I was surprised at how well the finish came out and the way light refracted off it at different angles, really setting it apart from other finishes. Overall, I like this finish more than I like a polished look, so I decided to continue the theme inside the case and use the brushed-swirl finish on all the aluminum surfaces.

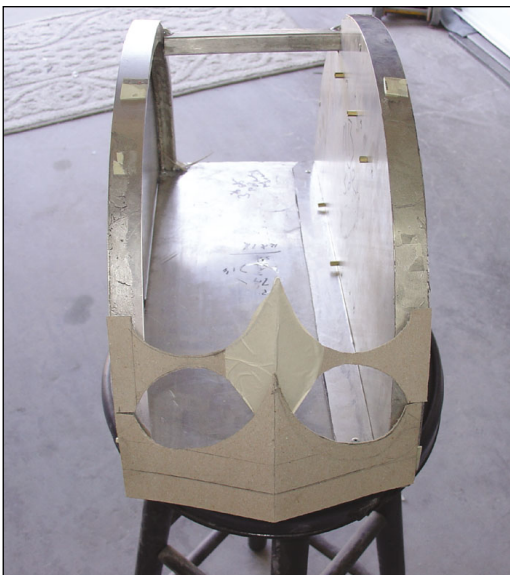
After five long days, I finally had my spikes. In less than 24 hours, I had to

finish the case, pack it up, and fly it to Dallas for the Cyberathlete Professional League's summer event. For the first time, I had all the parts in one place. I just had to put them all together.

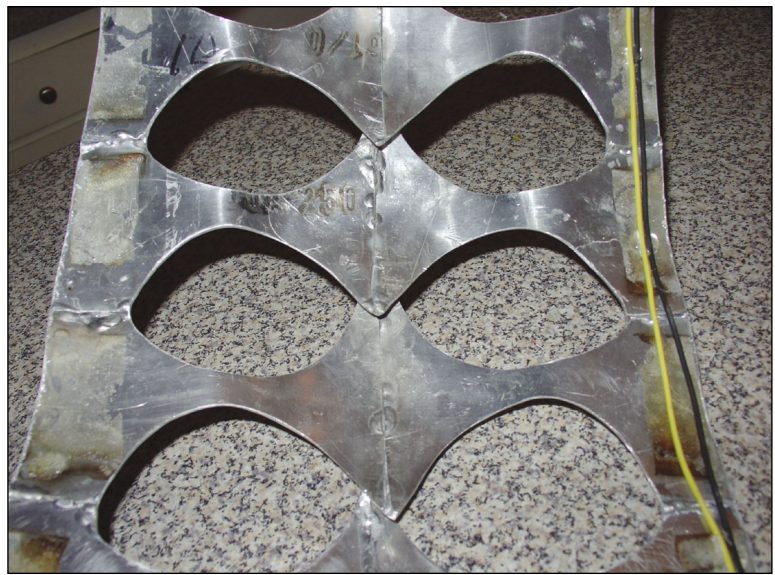
First, I drilled and tapped the assembly to the case. I used stainless-steel Allen-head machine bolts for this. They not only look good, but they also add to the security of the case. With the spikes in place, I went to work on the CD-ROM tray. Using some silicon and black acrylic, I mounted the master spike in place, officially "stealth" the drive. Ironically, in less than 18 hours this part would break off in transit, making the time I spent on it pointless. I've since fixed it, however.

In addition, I have since scrapped the backplane because it detracted from the flow of the interior, making it look cramped. In the end it looked better without it. This meant, however, that I had to fabricate some mounting brackets for the power supply. A strip of angled aluminum did the job nicely.

Switch placement has always been a problem with this design because of Spike's minimalistic design. I simply could not find a good place to fit the switches. As a solution, I placed a single power switch in the rear spike so that I can power the system up. There really is no other use for the button,



Putting the spikes in place required adjustments, several welds, and some readjustments.



Getting the spikes just right required tack welds, not to mention a complete switch in design in midstream when a first attempt to create them turned out all wrong.



Spike at work. Notice the open airflow design to the inside of the case.



All lit up. Red LEDs inside the case provide a fitting glow to match the custom red paint job.



A beauty or menace? A little of both actually. The LEDs give Spike a mean look in the dark.

so why stick it on the front where it will detract from the overall look of the case?

Using some silicone adhesive, I mounted the side panels to the frame, taking my time to line them up correctly. This was the first time I had placed the side panels on the frame with the spike assembly, and I finally got to see what the finished product was going to look like. After the hardware was mounted and the case was wired, it was time to give it the ever-stressful power-on test. In true form for this build, Spike did not click on. My heart sank, and I started to laugh hysterically. I soon regained my composure and started troubleshooting

from the power outlet backward. I quickly found that the power supply was DOA. I grabbed a spare ATX power supply I had and quickly wired it. The system booted, and a huge weight was lifted from my shoulders—only to be dropped right back on when I realized what time it was.

It was now 11 p.m., and my flight left at 6:50 a.m. There was no time to get a new power supply before I had to leave, so I had no choice but to continue finishing up the case without a power supply. All the time I had spent rewiring and sheaving that power supply, and I never thought to check that it functioned first.

still had to extend the ATX and 12V rails to make the unit fit.

After a few hours of soldering and final preparations, the case was done. As the operating system loaded, I had some time to reflect on the build. I have been brutally honest during the last few months. Sometimes things didn't go smoothly, yet faced with defeat I refused to let this project get the better of me. When this all started, I stated that it's the most ambitious design I had come up with, and it proved to be a challenge. I learned a lot about the processes that went into building this case, and I gained a new appreciation for aluminum. If I were asked to duplicate this case, I would have to think long and hard before giving an answer.

I often say that the cases I build have my blood, sweat, and tears in them. And like others I have made before, this one really does. As I sit here writing this, I still have the blisters, burns, and cuts on my hands I received while making the spikes. Sweat from my brow is mixed in with the fiberglassing I did in the 100-degree heat of Southern California. If you look closely at the frame, you may even find the salty remains of a tear or two after I regretfully forgot to put my safety glasses on while grinding. But with all the stress, expense, and anguish, I still love what I do. To some it may just be a fancy-looking PC case, but to me it's a work of art that happens to look as good as it performs. **CPU**

Quick, Fast & In A Hurry

I hastily finished the last details of the case. The lighting was the last thing to go in before I packed it in a box for the trip from Los Angeles to Dallas. Upon arrival in Dallas, I immediately set upon finding a replacement 1U power supply. After hearing of my plight, Cameron Rogers and the Shuttle team set me up with a 240-watt power supply that they happened to have in their sponsor booth. Finally, I had a spot of luck in this build. But I



Notice the brushed-swirl effect on the aluminum. It looked so good, Gareth decided to use it on the inside, as well.

by Gareth Powell

Mad Reader Mod

Tubes & Hoses & Chrome, Oh My

The Orac³'s list of materials sounds like the contents you'd find in a trash bag: shower hoses, a plastic folder, aquarium hoses, an exhaust pipe extension, and pieces of mousepads—oh, and more than 400 steel bolts, nuts, and screws. But the Orac³ won't be headed for the dumpster anytime soon. In fact, it's one of the coolest Plexiglas case mods we've seen.

Aside from its picture-perfect appearance, what separates the Orac³ from the wannabes are its extensively modded components. Peter Dickison, aka G-gnome, spent more than nine months customizing each component, including everything from the rewired watercooling pump to the backlit drive buttons.

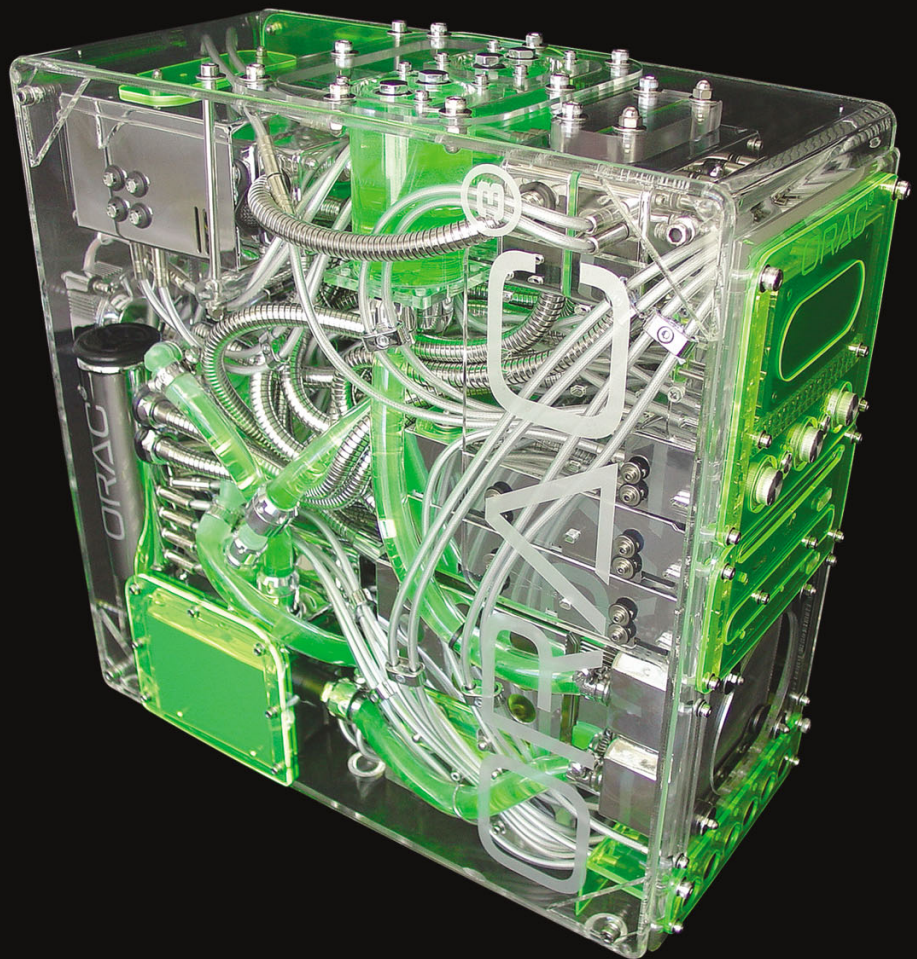
Dickison, an officer in the Australian Army and a writer for bit-tech.net, chromed or built chrome covers for every item, including the motherboard. He even built a junction box, which extends the PSU and handles many of the power cables.

So what's under all that chrome? A 3GHz P4C, an ABIT IC7-G mobo, a Sapphire Radeon 9800 Pro, 1GB of Corsair TwinX PC3200, and four 80GB Seagate drives (RAID 0+1). We're glad Dickison snagged some good components because he has no plans to mod upgrade parts.

"As a keen modder I'm already designing and working on my next case," Dickison says. "When this one becomes dated in a few years, I'll just set it on the shelf as a decorative piece."

If you run out of shelf space for your mods, Peter, we have plenty of storage room here at *CPU*.

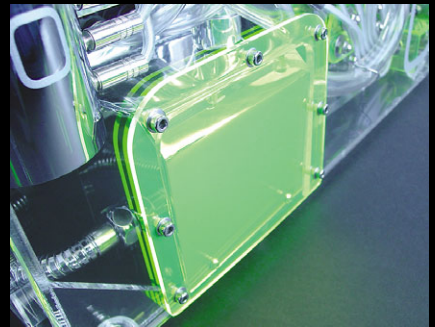
by Joshua Gulick



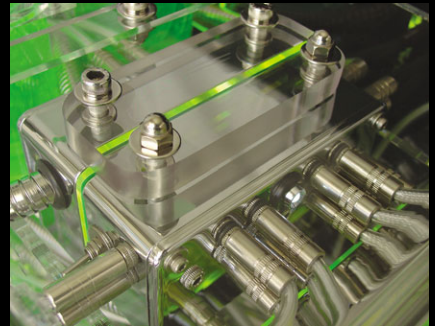
We never would have guessed that a chrome exhaust pipe makes this junction cylinder. The cylinder links some cables and terminates others.



Although the steel pump cover case better fit an Eheim 1048 Centrifugal Pump, Dickison wanted to use the more powerful 1250. After modding both the pump and the PC case, Dickison fit the pump into the steel case.



Dickison couldn't connect all of the Orac's sleeved cables that distribute power through the system, so he placed the junction box on the other side of the water-cooling system's reservoirs.

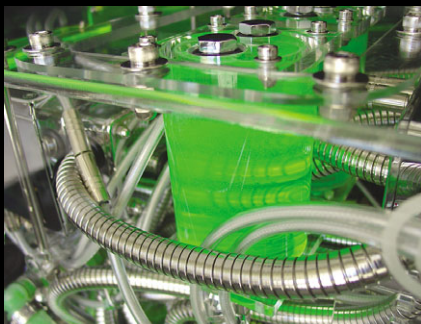


Dickison discovered the importance of having the right drill bit (in this case, a Plexiglas-friendly bit) when his standard drill bit cracked the reservoir's top plate. He made a second plate and used the appropriate bit to drill the holes. The reservoirs are modded CritiCool reservoirs.



Have a computer mod that will bring tears to our eyes? Email photos and a description to madreadermod@cpumag.com. If we include your system in our "Mad Reader Mod" section, we'll send you a \$1,500 Newegg.com gift certificate and a one-year subscription to *CPU*.

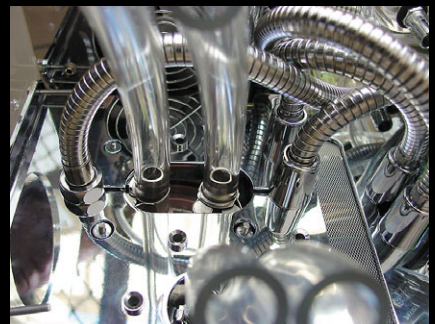
The Orac3 boasts more than 400 steel bolts, nuts, and screws and 50 feet of shower hoses.

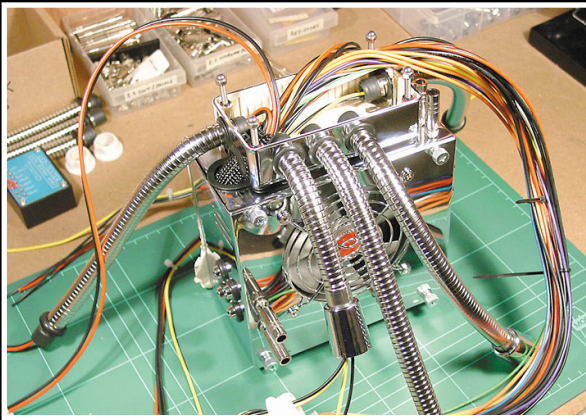


The rear of the front switch panel organizes the switch cables, which are located inside aquarium air tubes.

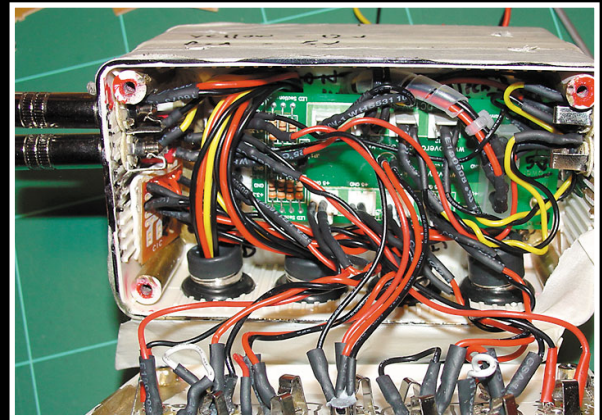


Dickison left no part unchromed. Even the motherboard has a chromed Plexiglas cover.





The modded PSU has a few shower hoses.



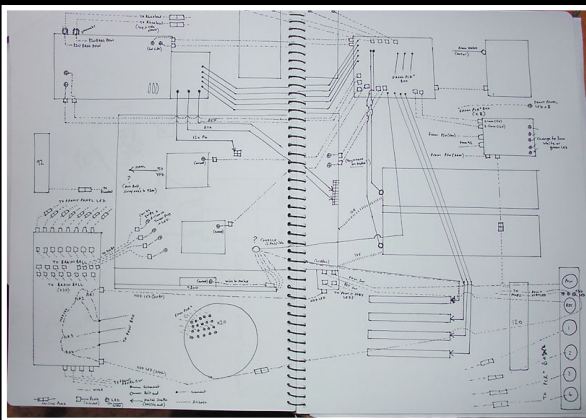
A PCB inside the junction box provides power to the LEDs.



The steel cover houses a modded Eheim 1250 Centrifugal Pump. Dickison vinyl-dyed the exposed portion of the pump.



The brown paper protects the white Plexiglas mobo cover from drill and saw scratches. Dickison later chromed the cover.



Dickison sketched the system and detailed the mods before he began his nine-month build. "Most components came out exactly as I had sketched them," Dickison says. "I still look at the sketches now and am surprised at how the drawings I did months before the project started look exactly like the finished pieces."



Here is yet another example of the detail and lengths that Dickison went to in order to give the Orac3 its distinct look.

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Each month we dig deep into the mailbag here at CPU in an effort to answer your most pressing technical questions. Want some advice on your next purchase or upgrade? Have a ghost in your machine? Are BSODs making your life miserable? CPU's "Advanced Q&A Corner" is here for you.

AJM asked: I just upgraded from an ATI Radeon 9800 Pro to a BFG GeForce 6800 GT and think there may be something wrong. After installing the 6800 GT, I ran a few benchmarks and found that my 3DMark03 score went up a few thousand points, but some of my games like Call Of Duty and Unreal Tournament 2003 aren't much faster at all. My system is loaded with a Pentium 4 3GHz CPU and 1GB of PC3200 RAM, and I have a 17-inch Sony Trinitron Flat CRT monitor. Shouldn't my new GeForce 6800 GT be faster in all of my games?

A: Technically, in all 3D-intensive tasks where your video card's peak fill rate and memory bandwidth are taxed, yes, your new GeForce 6800 GT should be faster than your Radeon 9800 Pro. However, there are a number of other factors that also affect gaming performance. Processor speed and available system memory

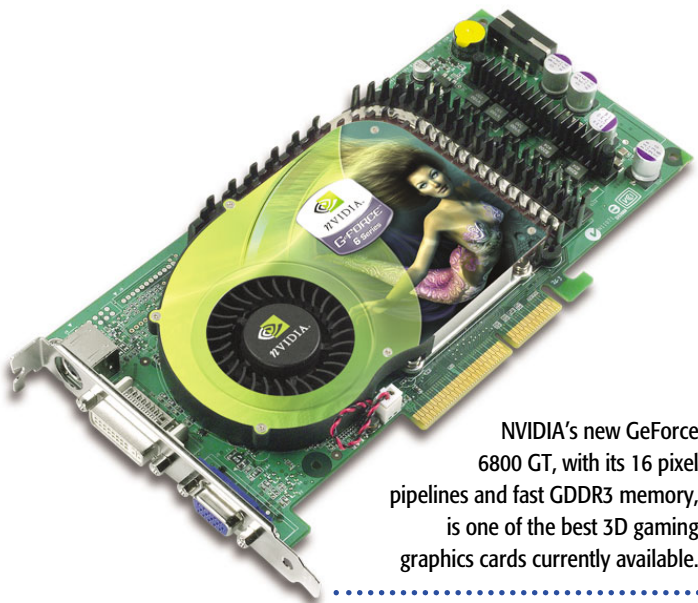
memory play a big role in overall performance because much of the game AI and physics are calculated on the host CPU.

We're going to assume that because you have a 17-inch monitor, you typically play games at a resolution of 1,024 x 768 or 1,280 x 1,024. With a high-end video card such as a GeForce 6800 GT or Radeon 9800 Pro, unless you have the AA (antialiasing) and AF (anisotropic filtering) enabled and maxed out, you won't be using all of your video card's available fill rate or memory bandwidth. This shifts the performance bottleneck to your CPU and system memory. When your games are "CPU bound," your maximum frame rates will be determined by the speed of your processor and system memory. This is probably what is happening with Call Of Duty and Unreal Tournament 2003. Neither of these games is taxing your video card at the settings you are using. Try cranking up the resolutions and turning on AA and AF, and your GeForce 6800 GT will probably pull way out in front of the 9800 Pro.

Ed M asked: I'm in the market for a new video card so I can play Half-Life 2 and Doom 3, but I was wondering if I even need one. I bought my computer through school, and it came with a FireGL X1 graphics card, which is more intended for professional applications, but I think may be powerful enough to run newer games. How much will I gain by buying a new ATI or NVIDIA graphics card in the \$150 to \$200 range?

A: We've tested the ATI FireGL X1, and essentially, at its core, you can think of it as a Radeon 9700 Pro, at least from a gaming perspective. However, both ATI and NVIDIA optimize their respective core graphics technologies at the hardware level (although they are intentionally vague as to exactly what modifications they make) to meet the demands of specific CAD, digital content creation, 3D design and rendering, and image analysis applications. Regardless, in our tests of this card in gaming scenarios, it is essentially on par with its consumer-targeted counterpart. There are also software mods out on the 'Net that will allow you to set up your card so that it actually appears as a Radeon 9700 Pro, and you can install ATI's latest Catalyst drivers for consumer cards. So, your question really centers on whether or not a \$150 to \$200 investment in a new graphics card will buy you additional features or performance in gaming applications vs. a Radeon 9700 Pro.

If you can swing toward the higher end, \$180 to \$200 these days will buy you either a Radeon 9800 Pro or NVIDIA GeForce FX 5900XT. The Radeon 9800 Pro should offer better performance than the 9700 Pro, for sure, and it's slightly more enhanced to handle DX9-gaming situations. The GeForce FX 5900XT really isn't much of a step up from your Radeon 9700 Pro, which frankly is still a very strong card even today. All told, it may make more sense to wait for price drops on the recently launched midrange ATI Radeon X800 Pro and NVIDIA GeForce 6800 graphics



NVIDIA's new GeForce 6800 GT, with its 16 pixel pipelines and fast GDDR3 memory, is one of the best 3D gaming graphics cards currently available.

bandwidth have a dramatic effect on gaming performance in most circumstances, as well. The reason you're experiencing a big jump in 3DMark03, and not some of your other games, is because your video card is the limiting performance factor in that benchmark. 3DMark03 derives its final score by using performance metrics that are almost exclusively determined by the speed of the video card. In real-world gaming scenarios, though, your processor and system

cards. These are 12-pixel-pipeline GPUs/VPUs that will offer substantial performance gains over the eight-pixel-pipeline Radeon 9700 Pro core.

Paladash asked: Hi Guys. I've been holding out on getting a new motherboard because I want one that will support PCI Express. I'm a big gamer, so I also want to take the plunge and buy an Athlon 64 FX-53 processor. I know that the new Intel i915 and i925 chipsets support PCI Express, but I have been told that there are no AMD chipsets that support PCI Express yet. Is this true? And do you know when or if Athlon 64 motherboards will support PCI Express? Thanks for your help.

A: Yes, it is true that there are no Athlon 64 motherboards currently on the market that support PCI Express, but they will be available in the not-so-distant future. They may even be available by the time you read this. There are two main reasons that PCI Express hasn't been integrated into Athlon 64 motherboards/chipsets just yet. First, there is virtually no difference in performance between AGP 8X and PCI Express at the moment, and second, AMD uses its HyperTransport bus technology with the Athlon 64. And HyperTransport originally didn't have the ability to map PCI Express host bus adapters. This issue is resolved, however, with the new HyperTransport 2.0 specification. HyperTransport 2.0 provides up to a 75% throughput increase over the original specification and will support protocol mapping of HyperTransport to PCI Express.

There have already been some announcements from the major players in AMD Athlon 64 chipsets in this regard. VIA has begun sampling its K8T890, which has PCI Express support, and SiS' SiS756 chipset is being readied, as well. With NVIDIA's recent announcement of its SLI multi-GPU technology, which requires two PCI Express slots, you can rest assured that the next-generation nForce chipset for the Athlon 64 will also support PCI Express. Based on information we've received over the last few weeks, we expect hardware to arrive late in the third quarter of this year, so you'll have to sit tight just a little bit longer.

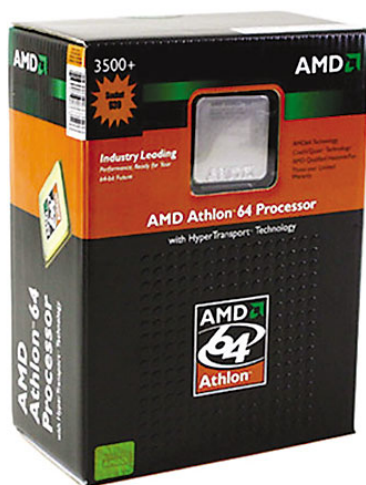
Courtlandre asked: I just got a Hercules 3D Prophet with the 9800 Pro chipset. It was working great for a week or so, but recently the graphics have been messing up. It will take parts of the screen and keep them on the screen, even when I change the window. It's like there is monitor screen burn, but sometimes it appears, and sometimes it disappears. Anyway, it happens while using the Internet and just normal applications. My case temperature is usually around 115 degrees Fahrenheit. Is that too high? What could be the problem?

A: Court, we can say with some certainty here that your case is running too hot. 115 F is about 46 degrees Celsius, which is actually about the idle operating temperature of a high-end processor such as

a P4 or Athlon 64. Temps inside your case shouldn't climb much above 30 C to 35 C, and we have workstations in the lab that run at 28 C or so all day long.

What you are describing here with your graphics card sounds like a classic case of screen corruption due to excessive heat buildup. Make sure your graphics card's fan is spinning properly and that the card is relatively free of dust and lint. Then we would recommend you figure out a way to get another intake fan installed in your case somewhere. If you can install a side panel fan that pulls air in directly over the graphics card, that would be ideal. If not, even a simple intake fan installed in the front of your case, where most standard chassis have a mount for one, would probably help your situation a lot. Good air flow is important for any high-end system, especially if you are going to be gaming with that Radeon 9800 Pro, and who wouldn't?

Mike B. asked: I was thinking about upgrading my system to a new Athlon 64 when I noticed that the new Athlon 64 3800+ has 512KB of L2 cache. However, the older Athlon 64 3400+ has 1MB of L2 cache. Why would AMD do this? Won't this hurt performance on the new Athlon 64s?



The Socket 939 AMD Athlon 64 3500+ has only 512KB of on-die L2 cache, but it has a 128-bit memory controller.

A: AMD's Newcastle core, which is used on the recently released Athlon 64 processors for the Socket 939 platform and a few other low-end Socket 754 CPUs, is equipped with "only" 512KB of cache for a couple of reasons. Opteron and Athlon 64 processors with 1MB of cache have relatively large dies and are expensive to produce. Cutting the amount of on-die L2 cache in half drastically reduces the size of the die from 193mm² to 144mm², which makes the Newcastle core much less expensive for AMD to manufacture. With a 25% smaller die, AMD can squeeze more dies on a single wafer of silicon and produce more processors in the same amount of time. (They're still charging a premium at the moment, however.) And the performance difference between an Athlon 64 with 1MB of L2 cache vs. one with 512KB is not dramatic at all.

In a recent review of AMD's Athlon 64 FX-53 (2.2GHz) with 1MB of L2 cache and an Athlon 64 3800+ (2.2GHz) with 512KB of L2 cache, we saw performance deltas of only 3% to 5%. Also note that with the Socket 939 Newcastle variants, the Athlon 64 3800+ and 3500+, AMD has incorporated a 128-bit memory controller (dual 64-bit channels), which doubles peak memory bandwidth from 3.2GBps to 6.4GBps. This will increase system performance and somewhat negate the effects of the smaller cache, especially when compared to Socket 754 processors like the 3400+ you mentioned. ▲

by Dave Altavilla and Marco Chiappetta, the experts over at
HotHardware.com

For more answers to your questions, subscribers can go to
www.cpubug.com/cpubug04/q&a.

Windows Media DRM 10

Microsoft Janus Takes Aim At Apple



Windows Media DRM 10 will appear in Windows Media Player 10.

Stop us if you've heard this story before: Apple begins marketing cool technologies that work seamlessly, giving users an easy method for accomplishing a desired task. Soon after, Microsoft begins offering its version of the technologies, hoping to improve on what Apple offers. The battle for customers is underway.

Although that story sounds a lot like that one that began playing out in the late 1980s and early 1990s between Apple's Mac and Microsoft's Windows in the computing arena, it also sounds a lot like one that's beginning to play out in the world of digital music.

Apple, with iTunes and the iPod, has grabbed the early lead in the online digital music market, but Microsoft is hoping its new Windows Media DRM (digital rights management) 10 technology will spur some serious competition for Apple's offerings. DRM 10 (code-named Janus during development) should also spur some new online digital music store concepts.

Flexible Music Options

DRM 10 will work across a variety of devices, including next-generation Windows Media Center computing systems and portable devices (such as media players and set-top boxes). When using DRM 10, a system will treat a portable music player similarly to an external hard drive.

DRM 10 was originally pegged for release in January 2003, reportedly in an attempt to be in the market before Apple's iTunes. Although Microsoft never officially gave a projected release date for DRM 10, industry experts say the delay in the release probably occurred because of the complexity of the technology required to make DRM 10 work—both from a software standpoint and a hardware standpoint.

Microsoft officially announced Windows Media DRM 10 in May 2004. The technology will be part of WMP (Windows Media Player) 10, scheduled

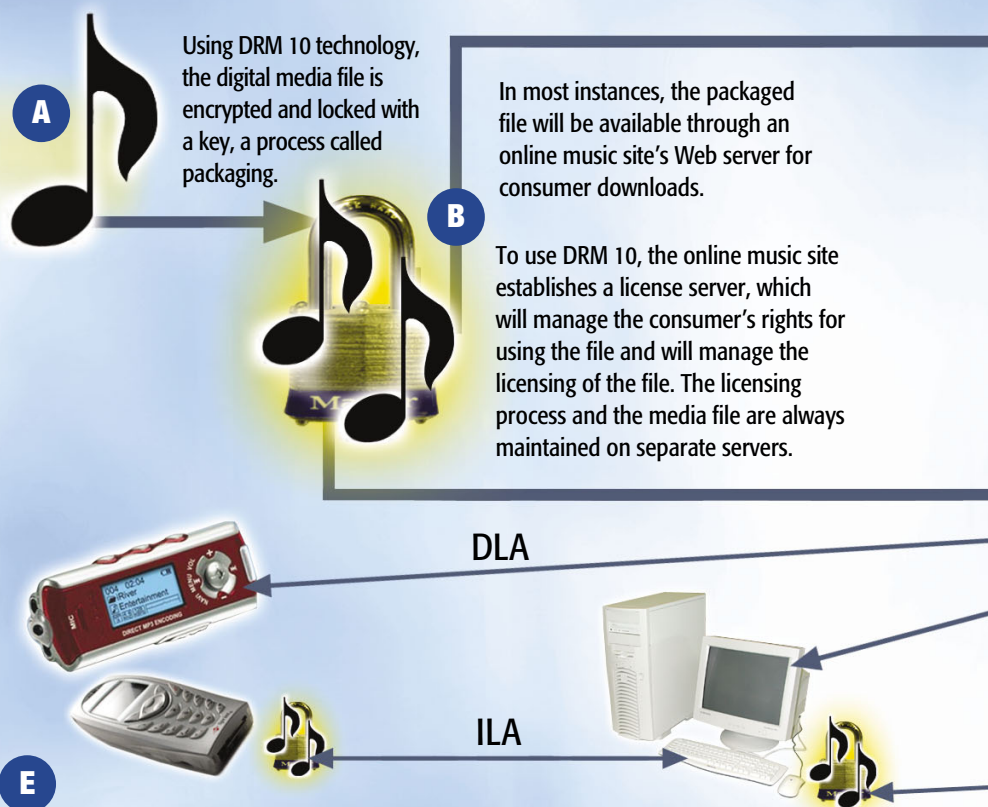
for release this fall. WMP 10 currently is in the public preview beta version, which was made available for download in June. The DRM 10 features in WMP 10 aren't useable in the beta release because no DRM 10-capable hardware is yet available.

Music Subscriptions

The most highly anticipated aspect of DRM 10 is its ability to allow consumers to have rights to play music files on a PC or on a portable media player. Most current formats are geared to disallow using

DRM 10 In Action

A complex series of steps is required to make DRM 10 work with portable music players and other portable devices, giving consumers the flexibility in playlists they want and giving music providers the security features they want.



In some instances, a portable device (such as a Web-enabled cell phone) will be able to directly connect to the Internet and check the validity of the license or download a license from the license server (called DLA, or direct license acquisition). Using DLA, a portable device might be able to download the music file directly from the online music site, too.

When the portable device communicates with the license server through the PC, the process is called ILA (indirect license acquisition). When using ILA, portable devices can refer to the master license stored on the PC at any time to update the license stored on the portable device.

the music files on any device other than the one on which the consumer downloaded them, which typically eliminates portable media players.

DRM 10 will enable online music services to start subscription-based services that give consumers an easy option for using the music on a portable media player. Essentially, this type of subscription service would allow users to rent songs by the month. The consumer could download a large number of songs to a portable digital music player as part of the monthly subscription price. (The number of songs

available to the consumer would depend on the service provider and the type of subscription purchased, but most experts say they expect the high end of the subscription packages to cost \$15 to \$30 per month for an unlimited number of songs.)

Most current music services let consumers buy digital music for around \$1 per song. Consumers then store the song's digital file on their hard drive, giving them complete access to it on the PC. No additional fees are required in the future; they "own" the song. In most instances, the online music retailer sells the song in a

digital format that only works with certain software and cannot be copied to portable music players. (However, ripping the music into a new digital format—often MP3—that's useable on a portable music player usually isn't a difficult process.)

DRM 10 would make the digital music files automatically available on a digital music player (eliminating some hassles for consumers), as long as the subscription remains active. Once the subscription lapses, the DRM 10 technology would make the digital music files inaccessible, and consumers could no longer play them.

Some subscription-based online music services currently are available, and they allow consumers to download thousands of songs to their computers. However, the services prevent consumers from copying the music files to portable music players because the MP3 format doesn't support the ability to make the files inaccessible when the subscription lapses. DRM 10 fixes this problem.

Pros & Cons

Those who support the idea of subscription-based music libraries say consumers will appreciate several aspects of the idea.

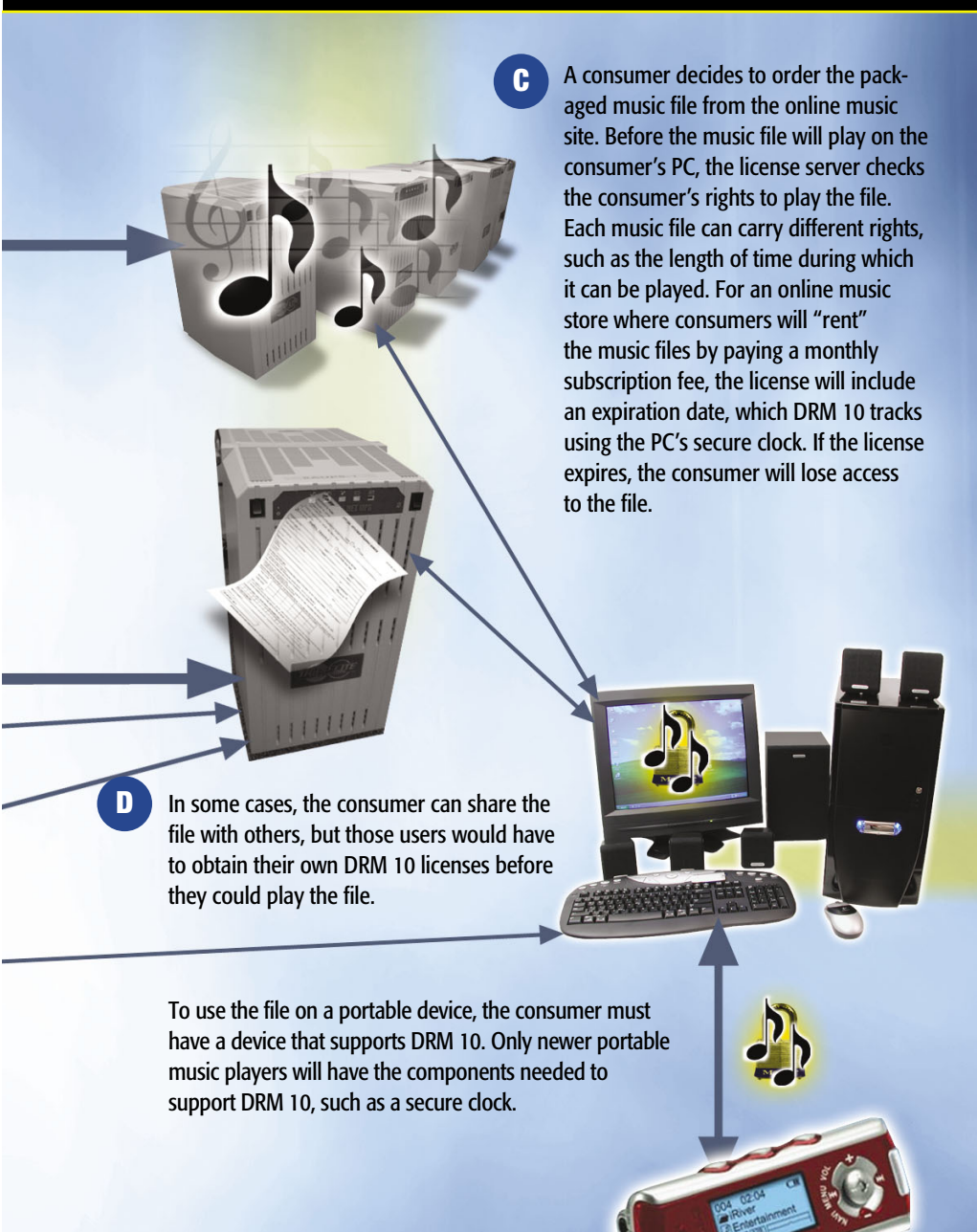
Large playlists. With a monthly subscription, a consumer could carry a library of thousands of rented songs by spending \$10 to \$30 per month. Conversely, purchasing 5,000 songs at \$1 per song would cost—get out your calculators—\$5,000.

Add new songs. You can constantly change your playlist with a subscription service without a change in your monthly fee. Conversely, if you add a new song per day at \$1 per song using the currently popular services, you'd probably exceed the monthly subscription fee at most sites.

No hassles. By including direct copying to digital music players as part of DRM 10, consumers would experience a lot less hassle with trying to rip digital music files they've purchased.

Less piracy. DRM 10 has to provide an advantage for the music companies, right? Microsoft says DRM 10 will make music piracy vastly more difficult because users won't have the right to permanently store the digital music files.

Consistent revenue. Pay-per-download sites have little consistency in monthly



Digital Media Support In Windows

The first digital audio and video capabilities in Microsoft operating systems and operating environments appeared 13 years ago in Windows 3.0.

October 1991. After Creative's release of the Sound Blaster audio card, Microsoft introduced its first media player software in Windows 3.0 with Multimedia Extensions, which could play CDs and WAV files.

April 1992. Microsoft slightly updated the look of WMP (Windows Media Player) in Windows 3.1.

December 1994. Microsoft introduced its first 32-bit WMP version, which appeared in Windows 95/98.

October 1999. This version of WMP included Microsoft's first DRM (digital rights management) for music and video. It was included as part of Windows 2000.

September 2000. Microsoft included several key features in the Windows Me edition of WMP, including CD copying and burning. Support for the WMA (Windows Media Audio) and Video 7 codecs appeared, as well.

October 2001. The Windows XP version of WMP included DVD playback and MP3 playback support. Support for the WMA and Video 8 codecs appeared, too.

January 2003. Microsoft introduced the Windows Media 9 Series for WinXP with support for several features, including video-smoothing technology and high-definition WMV (Windows Media Video).

June 2004. Microsoft introduced the public preview beta version of Windows Media 10 Series for WinXP, which includes Windows Media DRM 10 technology. Visit www.microsoft.com/windows/windowsmedia/mp10/default.aspx to download the beta. ▲

revenue. Subscription services would provide a more steady income stream for online music sites.

Despite the pros we've listed, many experts say DRM 10 and the music-for-rent idea have very little chance of succeeding for several reasons.

Changing the mindset. Consumers are familiar with the idea of purchasing music on a CD and owning that music forever. Many current online music services continue that idea, allowing consumers to purchase music and own the digital file. Some experts say consumers won't embrace the concept of renting music for at least several years.

Hackers' delight. Some analysts say at some point, a hacker could crack the DRM 10 code, forcing music providers to change the subscription model, which could leave consumers with a less favorable model.

Certain restrictions apply. These types of monthly subscription services won't work with every type of portable media player. For example, it's doubtful Apple will change iTunes to work with DRM 10. And, as of now, DRM 10 won't work with Apple's popular iPod. Older portable media players won't have the capabilities necessary to handle DRM 10, either.

What's Ahead

Even though disagreements abound on exactly how enthusiastically consumers

will embrace subscription-based music services, most experts agree that the services won't make a significant impact in the world of digital music anytime soon. Even those who think the services will be a success say such services could take a few years to become popular. One of the biggest holdups will be the need for consumers to purchase new portable music player hardware that supports DRM 10.

Eventually, consumers could purchase digital music subscriptions almost like cell phones: Purchase a qualifying subscription plan and receive a free DRM 10 portable music player, for example.

Even cynics have to admit the subscription model for running a business has worked in a variety of other areas, including cable TV, Internet, and radio. (Who would've predicted 10 years ago that we'd be paying for radio today?)

In its simplest form, this debate boils down to Apple vs. Microsoft yet again. Instead of Mac vs. Windows this time, though, it's iPod vs. WMP. It may not have the lasting impact on the computing world that the Mac/Win debate is still having, but it should make for an interesting digital debate over the next few years. **CPU**

by Kyle Schurman

For bonus content, subscribers can go to www.cpumag.com/cpuoct04/drm10.

Secure Clock

Microsoft's DRM 10 technology requires a secure clock, which helps it determine when a subscription has expired. PCs have the memory, processing power, and electrical capabilities necessary to support the secure clock, but portable music players traditionally haven't had such capabilities. To work with DRM 10, the players' engineers needed to reconfigure the hardware to boost the

components for making the hardware's secure clock work properly, including improved battery life and processing power. Some experts say this difficult engineering task delayed the introduction of DRM 10 by at least 12 months.

DRM 10's secure clock works in a portable music player similarly to how a temporary software license on a PC works. The license monitors the secure clock

in the PC. When the software's test period expires (according to the secure clock), the license blocks the PC's access to the software's files. If the user decides to extend the license by purchasing the software or by adding on to the subscription period, the license resets its test period (according to the secure clock) and gives the PC access to the software again. ▲

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Graphics On The Go

Mobile Market Remedies

Notebook users who want to take the latest graphics technology for gaming on the road with them usually have two choices: Purchase a new notebook each time a new graphics technology debuts or switch to Nintendo's Game Boy Advance SP for gaming. Neither option is too enticing. Although the GBA SP is a surprisingly impressive gaming device, it doesn't offer quite the same graphics quality and game software quality as a

notebook. Unfortunately, buying a new notebook a few times per year probably won't leave much money for gaming software.

The best option would let you upgrade your current notebook's graphics capabilities. However, that's been a near impossibility for as long as notebooks have existed because of the complexities involved in designing a notebook's configuration. Most notebook brand designs are unique as

engineers attempt to squeeze the CPU, GPU, and other components into a confined space, all while dealing with heat buildup and power demands. These unique designs have made graphics upgrades in notebooks extremely difficult. Engineers often must design GPU modules in varying shapes to meet the needs of their overall notebook designs, which makes it difficult to swap GPU components.

With PCI Express technology prepared to improve the graphics performance of all computer configurations, including notebooks, the leading graphics hardware companies, NVIDIA and ATI, have developed plans for form-factor GPU modules for notebooks that let you upgrade the graphics hardware.

Meet MXM

MXM, short for Mobile PCI Express Module, is NVIDIA's plan for making

MXM connectors will support a variety of I/O options, including 24-bit LVDS (low-voltage differential signaling) display panel, VGA, S-Video output, component HD video output, two DVI outputs, and integrated graphics pass through.



SOURCE: NVIDIA

Hello? 3D Cell Phones Are Calling

High-end improvements in mobile graphics technologies aren't limited to notebooks. Cell phone displays are undergoing some vast improvements, including 3D technology.

Sharp Electronics introduced a dual-mode LCD for notebooks earlier this year that allows users to view 3D images without special eyewear. And with a simple flip of a switch, the LCD goes from 3D mode to 2D mode.

Sharp's technology uses parallax barriers to create its 3D images. The parallax barriers block certain light waves, limiting the light waves that reach each eye. With each eye seeing different light waves, the

brain merges the images from each eye, creating the illusion of a 3D image. By controlling which light waves reach each eye, the Sharp 3D LCD determines how the brain will create the 3D image. (We discussed this 3D technology in detail in "Sharp Images," page 34 of the March 2004 issue of *CPU*.)

A few months ago, Sharp began using its notebook 3D technology in cell phones available for sale in Japan. The technology works exactly the same in cell phones as it does in notebooks, just on a smaller scale. Samsung also has begun selling 3D cell phones in South Korea. (It's not known when, or if, Sharp and Samsung

will introduce 3D cell phone displays in the United States.) Although most of the 3D content for these phones consists of games, a Japanese company, Mobile Broadcasting, has announced plans to introduce streaming 3D video content to handheld devices before the end of the year.

ATI and NVIDIA both have introduced 3D chips for cell phones, although most industry experts say ATI has been quicker in releasing new 3D technologies. The chips will handle all other graphics processing work beyond 3D, as well, such as 2D graphics, MPEG-4 decoding for video playback, and image compression and decompression. ▲

notebooks more like desktops (at least when it comes to graphics). NVIDIA says it's not trying to make MXM an industry standard. Instead, NVIDIA

calls MXM "a consistent graphics interface for PCI Express notebooks." In the future, if MXM becomes widely used in the industry, NVIDIA says it's willing

to submit management of the specification to a standards committee.

MXM includes a single form factor and a single pin-out configuration,

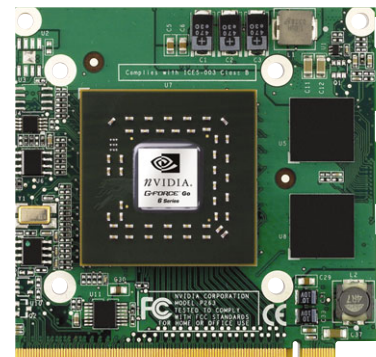
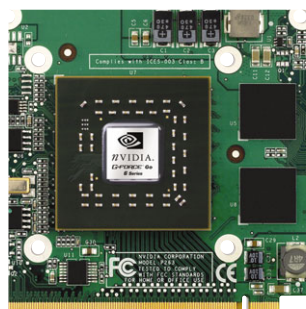
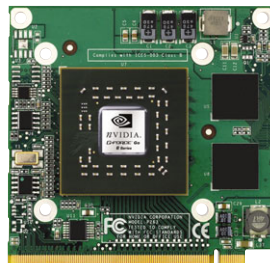
MXM's Three Flavors

NVIDIA's MXM GPU modules are available in three configurations. Each module is a different physical size and offers slightly different components. However, each of the three modules uses the same 230-pin connector, making notebook designs easier.

MXM-I (left). MXM-I modules are the smallest of the three modules (2.76 x 2.68 inches) and are aimed at ultrathin and ultralight notebooks. They also offer the least powerful components.

MXM-I modules can only accept up to 128MB of onboard graphics memory through their four memory modules.

MXM-II (center). MXM-II modules are slightly larger than MXM-I modules (2.87 x 3.07 inches). They will appear in mainstream market notebooks. The MXM-II module can support up to 256MB of onboard graphics memory through its eight memory modules.



MXM-III (right). MXM-III modules are aimed at high-end notebooks, including those in the desktop-replacement market. MXM-III modules are the largest available at 3.23 x 3.94 inches. The MXM-III module offers eight memory modules and can support up to 256MB of onboard graphics memory. It also can use a 256-bit wide memory interface found in many of the newest GPUs. ▲

MXM Type	Width	Length	Graphics RAM	Power Usage	Max GPU Size	Available Memory Interface Widths
MXM-I	70mm	68mm	Up to 128MB	Up to 18W	35mm x 35mm	64 bit or 128 bit
MXM-II	73mm	78mm	Up to 256MB	Up to 18W	35mm x 35mm	64 bit or 128 bit
MXM-III	82mm	100mm	Up to 256MB	Up to 35W	40mm x 40mm	Up to 256 bit

SOURCE: NVIDIA

Install The MXM Module



1

NVIDIA designed the MXM GPU module with the idea of making it easy to insert into the notebook. The GPU module has a 230-pin, right-angle connector on the edge of the card. It typically slides into an open spot on the side and bottom of the notebook (Image 1).

You insert the GPU module at a slight angle into the connector on the motherboard (Image 2) and then rotate the GPU module upward and into place, adjacent to the motherboard.

Finally, you screw the module to the motherboard. The module's mounting



2

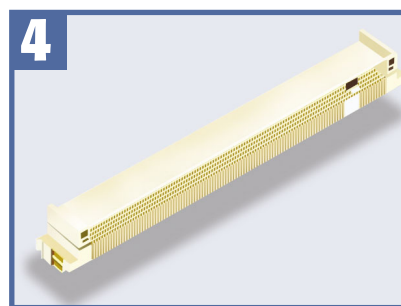
bracket will cover the entire open spot in the notebook (Image 3). The mounting holes will be the same for all three types of MXM GPU modules, allowing upgrades for motherboards that support the proper GPU module specification. For example, a motherboard that supports the MXM-III specification can accept any type of MXM GPU module (MXM-I, MXM-II, or MXM-III). A motherboard that supports the MXM-I specification, however, can only accept an MXM-I GPU module.

The MXM connectors on the motherboard (Image 4) initially will appear in



3

three heights: 5mm, 2.7mm, and 1.5mm. The MXM specification allows for other heights in the future, though. ▲



4

SOURCE: NVIDIA

allowing notebook designers to work with a single specification for graphics. With PCI Express bringing greater graphics power to the notebook, NVIDIA decided now is a good time to bring MXM to the market. MXM will support PCI Express' maximum 16-lane specification, along with all other display I/O signals.

NVIDIA says MXM will provide several benefits to everyone involved with notebooks, from the manufacturer to the end user.

Latest and greatest. By allowing for a single design for GPU modules, MXM allows ODMs (Original Design Manufacturers) to place the latest GPUs in notebooks almost as soon as they're released to desktops. In the past, notebook graphics would lag several months behind desktop graphics because ODMs had to come up with unique designs for GPU modules for each brand of notebook.

Only the best. Both notebook makers and end users now will have a choice as to which graphics solution they want; they won't be limited to whatever fits inside the notebook design.

Upgrades. End users can upgrade their notebooks with the latest graphics technology—something that was rare in the notebook market before MXM.

Potential Problems

Obviously, those who manufacture the notebooks must accept MXM as a specification before it will work for end users. It appears many have. However, one other key player must sign off on MXM to make it a graphics industry standard: ATI.

ATI and NVIDIA are competing to become the leading graphics processor manufacturer in the industry. Not surprisingly then, ATI doesn't appear thrilled at the idea of backing a specification that NVIDIA chiefly developed.

Some in the industry say this problem could've been avoided by simply tying MXM with the PCI Express specification, which several companies championed, led by Intel. ATI officials say they'd be more receptive to an idea like MXM if it had come from a specification committee or a collaborative effort from industry members. (ATI officials say they were never contacted about working on MXM.)

Because notebook ODMs design the notebook GPU modules (rather than ATI and NVIDIA), and because MXM deals directly with GPU module design, NVIDIA says it didn't need to include ATI in the planning process for MXM. NVIDIA has made the MXM specification inclusive, allowing support for ATI GPUs on the MXM GPU modules.

Rather than signing off on MXM, ATI plans to continue working with individual manufacturers to develop graphics solutions that meet the

individual needs of customers, such as Axiom.

Meet Axiom

ATI announced plans in June for Axiom (Advanced Express I/O Module), which will allow manufacturers to swap out older GPUs for upgrades. The Axiom form-factor specification is an expansion of ATI's FlexFit form-factor idea that's been around for a few years, according to ATI. (FlexFit deals with pin compatibility for notebook GPU modules.)

Axiom will work similarly to MXM, but ATI says it has no plans to try to make Axiom an industry standard. ATI says Axiom will be more flexible than MXM by continuing to allow notebook ODMs to make some changes to the graphics modules when needed.

Axiom reportedly will support two module sizes, one for ultrathin and ultralight notebooks, and one for mainstream notebooks.

By the time you read this, Axiom and MXM technologies both should already be appearing in PCI Express-enabled notebooks. Lists of brands and models that will use the new technologies are continuing to evolve as more ODMs agree to include the technologies. (ODMs supply the notebooks to OEMs, which make some customizations to the notebooks and then sell them to consumers.)

End Users Win

In reality, ATI and NVIDIA GPUs have been available in swappable GPU modules for a few years, but those modules have been specific to the individual notebook manufacturer. With MXM and Axiom, however, the modules will no longer be limited by the manufacturer of the notebook.

Experts say MXM and Axiom will have their greatest initial impact on manufacturers who allow users to set up their own notebook configurations. With interchangeable GPU modules available, manufacturers can offer different graphics options without having to come up with several notebook designs. At some point, notebook users

GPU Model Design Progression

GPU manufacturers have gone through a few stages in creating graphics solutions for notebooks. Each step along the way has provided more flexibility in the designs of the GPU modules by ODMs. Some of the designs needed odd shapes to fit within the overall design of the notebook. The new MXM and Axiom specifications should simplify the GPU module designs.

Soldered GPU. The first notebooks to contain GPUs consisted of soldering the GPU to the motherboard (integrated graphics solutions). Obviously, this technique made any hope of upgrading the GPU impossible.

GPU modules. The next generation of GPU modules allowed them to be plugged into the motherboards through a socket. However, each module was unique to the brand (and sometimes the model) of notebook, making upgrades nearly impossible.

Vendor specific. GPU manufacturers recently began making GPU modules for certain notebook manufacturers that were swappable within the notebook manufacturers' various models. This solution provides some flexibility, but only within certain notebook models and with certain notebook manufacturers. Upgrades aren't possible between different brands from different notebook manufacturers.

Swappable. With the recent announcements from NVIDIA and ATI concerning MXM and Axiom technologies, end users should eventually have the option of swapping out GPU modules, regardless of the brand or model of their notebook (as long as the notebook manufacturer follows MXM or Axiom specifications).

As GPU module designs for notebooks have improved during the past several years, the amount of time required to bring the latest graphics technologies to the notebook market vs. the desktop market (the market lag) has greatly decreased, as you can see in this example using NVIDIA GPUs. ▲

GPU Design Step	NVIDIA GPU Example	Market Lag
Soldered GPU	NV17M	1 year
GPU modules	NV18M or NV34M	6 months
Vendor specific	NV31M or NV36M	3 months
Swappable	Any MXM GPU	Almost none

SOURCE: NVIDIA

themselves might be able to swap out older graphics components for newer ones, thanks to MXM and Axiom. (In some instances, an end user might even be able to change GPU brands when replacing the notebook GPU module.) Finally, MXM could be the first step toward giving industrious end users the ability to build their own notebooks, allowing them to easily select the best graphics processors for their notebooks.

In the final analysis, MXM and Axiom should provide the greatest benefits to end users. Consumers will be able to select the best graphics solution at the time they buy their notebooks, rather than having to settle for whatever GPU module will fit in their notebook design. As newer graphics

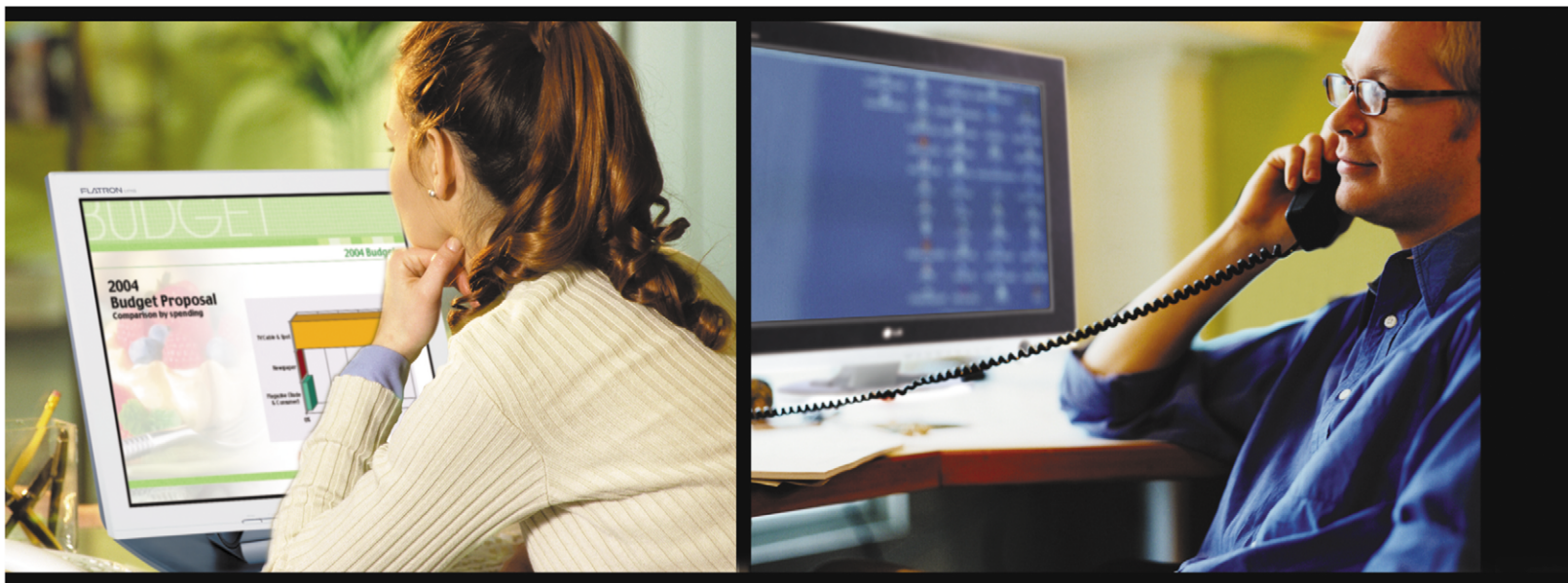
technologies develop, end users can take advantage of them immediately, too; market lag will no longer be a significant issue for graphics technologies in notebooks.

Finally, if MXM and Axiom are successful, it's likely that notebook manufacturers will look to make other notebook components—such as RAM and CPUs—more easily upgradeable, too.

End users are accustomed to having choices when it comes to desktop computing. With more choices coming in notebook computing, mobile users will be the ultimate winners. **CPU**

by Kyle Schurman

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OFF THE BEATEN PATH

Our Favorite One-Trick Tools & Undiscovered Utilities

by Steve Smith

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ON YOUR LOCAL SHELVES:
The Mainstream Utilities
You Shouldn't Overlook

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PENGUINS, ANYONE?
Linux Utilities To
Decorate Your Distro

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MAC OS X MADNESS
Utilities That Will
Make Panther Purr

65

NOT TO GO UNNOTICED
Scads Of Utilities
For Handheld Devices

As our old high school shop teacher used to tell us—ad nauseam, in fact—there is a tool designed for every job. The same is true for getting work done within the Windows operating system. From digital image red-eye removers to 3D animated Desktops, DVD shrinkers to lockboxes that will password protect just about anything your cursor can point at, there are more cool specialty tools for Windows than there are strawberry shuckers at Williams Sonoma. As we discovered more than a year ago in our roundup of lesser-known utilities, “They Have A Program For That?” (*CPU*, March 2003, page 52), they do indeed have a program for just about everything, and the world of shareware/freeware is brimming with programming creativity.

While we did include a few old favorites in this roundup of great (and sometimes strange) Windows utilities (and what do you mean you don't have PowerStrip yet?), we tried to go off the beaten path in this hunt. Some of our own editors and columnists revealed some of their hidden treasures (see the “What's On Your Hard Drive?” sidebars), and we looked for programs that generally haven't floated to the top of the usual online file libraries. Some are weird, many are useful, but they all demonstrate that necessity (what Windows left out) is still the mother of invention.

(NOTE: All of these programs are designed to run on Windows XP/2000.)

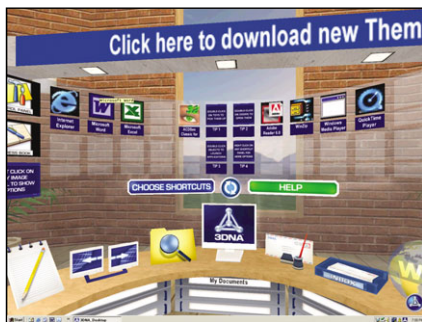
WARNING

After installing and testing all of the programs, we regularly ran Spybot Search & Destroy to detect any spyware or adware that the programs may have tried to place on our test system. While we failed to find any spyware in any of our installations, users should be aware that detecting spyware/adware is not foolproof, and you should always protect yourself when using freeware and shareware. Products such as WinPatrol (www.winpatrol.com) and SpyBlaster (www.javacoolsoftware.com/spywareblaster.html) monitor a PC to detect programs that try to install spies or communicate to the Web without your permission.

You Got The Look: Desktop Redecorators

3DNA Desktop 1.1

This gotta-try alternative interface turns your 2D Desktop into a 3D house where you literally walk among applications and media bays to click oversized icons to access all your familiar tools, apps, and data. Favorite photos can go on the walls, and you can walk upstairs to play a game of 3D hoops on the upper deck. 3DNA



3DNA Desktop 1.1

offers a number of 3D worlds, including underwater and Mercury. Clouds move across the sky, and the light changes according to real-time. Finally, Windows gets trippy. (Shareware; \$29.99)

www.3dna.net

Avedesk 1.1

Billed as a Windows Desktop enhancer, the program can place unique, oversized, fully configurable and programmable Desklets on your Desktop that can do a variety of tasks. Included in Andreas Verhoeven's 1.1 release is an FTP Desklet, which can send any file to your FTP server that you drag and drop onto the icon. Another Desklet recites text you drag onto it. Our own Chris Pirillo calls Avedesk "a freakin' sweet way to get interactive widgets and alpha-blended animated icons on your Desktop." (Freeware)

www.avedesk.com

CursorXP

If you are going to play with your cursor, then play with power. The free version of Stardock's CursorXP comes with a dozen prefab cursor themes, and you can download scores more made by a community of users and designers. Every aspect of the look and feel, from animations to shadows, is configurable in every one of the cursor's states. For the \$10 fee, the Pro version gives you transparent cursors, color changes, exotic animations, and mouse trails. And, yes, you (or your kids) can change your cursor into candy canes. (Shareware; \$10)

www.stardock.com/products/cursorxp

DreamRender

You've got all that 3D accelerator power under your PC's hood; why reserve it just for games when you can let it run your Desktop? From abstract visualizations to rain on a pond, sunflowers to flying bees in RayBans, DreamRender turns your wallpaper into 3D animated hallucinations. Scores of downloadable dreams depict various bucolic landscapes. The coolest feature is transparency, which makes all of your windows translucent so that the animated Desktop always shows through. Take your Dramamine because you may not be ready to live with a moving Desktop. (Shareware; \$19.99)

www.dreamrender.com

Microangelo Toolset

For total Desktop control freaks, there is nothing quite like rolling your own icons,

and Eclipsit's Microangelo is the mother of editors. In addition to a complete paint program for pixel-by-pixel icon modification, it has a screen capture tool that lets you grab images and turn them into icons and a brilliant animator that lets you create moving icons frame-by-frame. Other pieces in the suite help you manage icons on the Desktop, as well as create a library of usable icons. (Shareware; \$39.95)

www.microangelo.us

Stickmen Screen Saver

OK, we know that screen savers are lame, but we just can't resist a clever and creative one like the aptly-named Stickmen Screen Saver from The Spencer Group. It fills your Desktop with stick figure armies marching from either side of the screen to do various levels of battle. In this case, however, the otherwise innocent stickmen are carrying shoulder launchers, swords, and fire throwers, wreaking bloody carnage

What's On Your Hard Drive?

- Spambayes
- SpywareBlaster

Mike Magee



across the screen. A bloodless G-Rated version is available for those who object to the senseless loss of stick figure lives. (Shareware; \$4.95)

www.stickmenwar.com

Tweak UI

What do you mean you don't have Tweak UI yet? This venerable PowerToy from Microsoft has only gotten better over the years as the quickest way to tweak Windows' look and feel. The tabbed interface drills into all of the OS guts, from which icons get placed on the Desktop to menu and mouse behavior. Many of the common OS look-and-feel tweaks that many people adjust in the Registry can be set easily in Tweak UI

by checking or unchecking the right box. (Freeware)

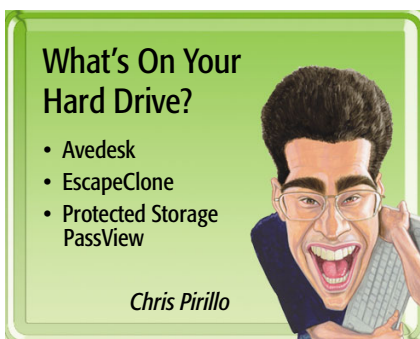
www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.msp

Tweak Me: Little Conveniences

Adobe Reader Speed-Up 1.28

Adobe Acrobat PDF files are the de facto standard for digital distribution of documents online and offline, but the Adobe Reader software is a slow-loading behemoth that always makes us think twice before loading one of these data files. Joseph Cox's superb Speed-Up program accelerates the Reader by disabling some of the modules that are unnecessary for reading most PDF files. Speed-Up keeps these modules in reserve for calling up if needed, but the net effect in most cases is a much spryer Acrobat. (Freeware)

www.tnk-bootblock.co.uk



EscapeClose

Chris Pirillo recommends this cure for the cluttered Desktop. The appropriately named EscapeClose (SaNaPe Software) lets you close the active window by hitting your ESC key, pretty much the way God intended. More cautious users can have the ESC key send the mouse cursor to the window's corner Close button instead for easy, quick action. A Pro shareware version (\$14.95) lets you define exceptions to this escape clause, define boot modes, and add a mode that minimizes rather than closes the window. (Freeware)

www.sanapesoft.com

jav16 Power Tools

Without the breadth of Super Utilities Pro, MaceCraft's jav16 is still a remarkably

deep set of system tools for advanced users. One suite of tools edits, searches, and cleans your Registry, while another helps you write scripts for automating tasks. Yet another cleans files and even hunts down empty directories and unused DLL files lingering in the system. Control freaks who love drilling into Windows' innards will love this one. (Shareware; \$29.95)

www.macecraft.com

Kill Win Pro

If PCs are so smart, then why do we need an astonishing program such as this to teach them how to shut down automatically and intelligently? BK-Soft's Kill Win Pro can not only schedule logoffs, shutdowns, and reboots, but you can also program it to first execute specific programs, hang up modems, open DOS boxes, and operate the program within scripts via command line options. You can even customize Kill Win Pro's System Tray menu of shutdown commands. It will make you rethink what your PC can do automatically. (Shareware; \$15)

www.bk-soft.com

Mo'Slo 4BIZ

Most tweaking programs claim to speed up your PC, but Dr. David's Super Crispy Software's Mo'Slo 4BIZ deliberately slows down the execution of select programs. It is recommended by Samit for PC veterans who have a trove of old DOS and Windows programs that can't handle contemporary processor speeds. Mo'Slo can create custom slowdown settings for the executable and produce a special shortcut icon with the profile. An online database of compatible programs includes games like XCOM and Magic Carpet. (Shareware; \$25)

www.hpaa.com/moslo

Remind!

Go way beyond Outlook's puny little alarm system with this gem from Crystal Office. You can create alarms that automatically initiate tasks, such as open a program, open a specific URL (great for reminding yourself about live Webinars), and even dial a phone number via your modem. Write notes to yourself that pop

up at a given time and customize alarm sounds and the look and feel of reminders. And, rest assured all you procrastinators out there; there is a Snooze button. (Shareware; \$19)

www.crystaloffice.com/reminfo

Super Utilities Pro

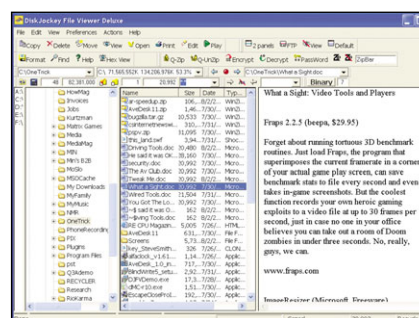
While it is one of the most expensive programs in our roundup, the sheer breadth of Superlogix's Super Utilities Pro functions makes it a bargain. A single, user-friendly console accesses a group of suites, from disk, Registry, and browser cleaners to an uninstaller, a shredder, a password protector, and even a tool for modifying options in your context menus. It also gives you control over startup programs and repairs shortcuts. This is truly the Swiss Army knife of PC utilities. (Shareware; \$54.95)

www.superlogix.net

Driving Tools: File & Disk Utilities

DiskJockey File Viewer

This is what Windows Explorer should have been, a full-featured file management program that lets you peek into 220 file formats and compressed files without opening the associated program. Clear &



DiskJockey File Viewer

Simple's DiskJockey File Viewer is perfect for browsing the contents of your docs and image files. The superb multipane interface can encrypt and password protect files with a single click, call up the command prompt, view Hex code, and even transfer files directly with an FTP server. The built-in browser is mighty handy, too. (Shareware; \$29.95)

www.clear-simple.com

Karen's Replicator

Karen Kenworthy, one of freeware's veteran contributors, hits a home run with Replicator, a dead simple way to automate backups. You choose your source files or folder, point to a destination (including networked drives), set the timer, and the program makes backups at regular intervals. A tagging function lets you append various time-stamp labels to each backup for easier identification later. Karen has taken away our last excuse for not making backups: We forgot. (Freeware)

www.karenware.com

Lupas Rename 2000 4.0

Media mavens know that MP3s and digital camera images often come onto our PCs with overlong and inappropriate file names. Lupas Rename is specifically designed to perform batch rename tasks. You can tag and rename select folders and files, replace or add text in file names or extensions, alter case, automatically number new file names, even undo mistakes and create batch files for renaming files under DOS. While a bit crude and in need of a Help file, Ivan Anton Albarracin's Lupus Rename is a great one-trick pony. (Freeware)

rename.lupasfreeware.org

Power Desk Pro 5

One of Samit's favorites, VCOM's PDP5 goes way beyond file management and puts virtually all of Windows' major functions (from command prompt to Regedit to Control Panel) on toolbars within a single console. It not only copies, zips, and synchronizes files and folders, but it can also preview many media formats (including video and audio files). PDP5 also lets you create custom Desktop toolbars. Imagine Windows Explorer... with a brain. (Shareware; \$39.99)

www.v-com.com/product/PowerDesk_Pro_Home.html

RegSeeker 1.35

Get a unique view of your system with HoverDesk's RegSeeker, which lets you see the Registry keys that contain your environment settings, browser and file use histories, startup programs, look and

feel options, etc. Double-click most entries, and RegSeeker brings you directly to the listing in RegEdit. A Registry Cleaner function vacuums out outdated links, and a Tweaking screen lets you toggle off things such as the arrow on shortcut icons and adjust the Start menu pop-up delay. (Freeware)

www.hoverdesk.net/freeware.htm

WinRAR 3.40

The other file compression format, RAR's multilingual file naming support makes it very popular internationally. RarLab's WinRAR is the compression engine that speaks fluent RAR and even comes in versions for 21 languages (including Macedonian!). It boasts special modes for optimal file size reduction of multimedia and text files and highly secure file encryption. With support for decompressing ZIP, ARJ, ACE, CAB, and many more archive types, WinRAR could be the only archive manager you need. And if you are Macedonian, there may be no other choice. (Shareware; \$29)

www.rarlab.com

WinUndelete

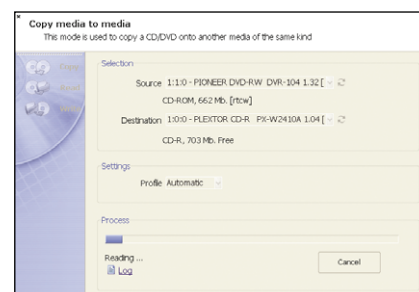
Never say "Oops!" again. Among file recovery programs, WinRecovery's WinUndelete is both powerful and very convenient. It works with most disk formats, from NTFS to DOS, and it can target a search for specific deleted file types. Best of all, it can exclude cluttered listings from deleted Internet and empty files. In our tests it ran very fast and did a great job of showing us where the deleted files were found in our directory tree. The built-in wizard walks you through every step. (Shareware; \$49.95)

www.winrecovery.com

Burnin' Fool: Media-Making Tools

BlindWrite 5

Backing up your copy-protected CDs and DVDs doesn't get much simpler than with VSO Software's BlindWrite. One button click makes either a byte-for-byte copy of one disc directly to a burner or on your hard drive for later copying or for use with virtual drive software. This one



BlindWrite 5

is perfect for those who don't need or want to fiddle with the minutiae of optical disc copying, and a throaty female voice even announces program events. (Shareware; \$35)

www.vso-software.fr

BurnQuick

The cool thing about this data and audio CD burner is that you don't have to load the program to use it. BurnQuick from Triton Interactive integrates with Windows' context menus so that you right-click a file and either burn it directly to CD or place it in a queue to burn later with other files. BurnQuick can make mixed media CDs that contain both CD audio and data. It is what WinXP's built-in CD-copying function should have been. (Shareware; \$17.95)

www.burnquick.com

DVD Decrypter 3.2.3

Lightning UK's DVD Decrypter is so good at unprotecting a DVD and copying it to your hard drive that we barely have to tell it what to do. It detects your DVD at startup, highlights all of its relevant files (though you can tag select chapters, as well), and asks you to click a button to make the recording. The files play back with any of the usual software DVD players, so it is perfect for notebook users (with hearty disk space) who want to bring a movie along with them without the disc. (Freeware)

www.dvddecrypter.com

DVD Shrink 3.2

This could be the most amazing freeware of any kind. DVD Shrink lets you scan a full-sized DVD and copy and

compress select pieces so that a 9.4GB movie DVD can be burned onto a 4.7GB DVD burner. It has a brilliant preview screen so that you can peek into any piece of the DVD structure, choose which audio tracks or titles to use, and completely reauthor a DVD to your liking. Simply incredible. (Freeware)

www.dvdshrink.org

Easy CD-DA Extractor 7.1

Its rips, converts, and burns, and Poikosoft's Easy CD-DA Extractor does all of them very fast and with stunning control and unique extras. It rips CDs (including many copy-protected ones) directly into any of 12 file formats (no extra plug-ins needed). The internal digital signal processor levels the volume and even "compresses" quieter passages so they stand out on car and portable players. Easy CD-DA Extractor even has an error recovery and repair mode for reading badly scratched CDs. For serious music managers, this is the one. (Shareware; \$29.95)

www.poikosoft.com

Easy DVD To DivX/VCD/SVCD Converter

The program name might be a mouthful, but that is because it eats enormous DVD discs and converts them to a wide variety of formats for playback on a PC or burning onto standard video CDs in VCD or SVCD formats. For basic users, it is a click-and-record affair, but advanced burners get to fiddle with the audio and video codecs' frame rates and A/V quality settings in order to customize the compression rates. (Shareware; \$29.95)

www.easydvdcdburner.com

PicsToCD 2.1

For making simple slideshows that you can burn to disc and even send to Grandma for easy playback, nothing beats Triton Interactive's PicsToCD. A wizard walks you through choosing images from your hard drive and lets you edit or reorient them and even add captions. The program converts the tagged and captioned pics into an HTML slideshow that burns

to disc. The slideshow autoloads when the CD is popped into another PC, so Granny can see an album of the grandkids without calling tech support. (Shareware; \$19.95)

www.picstocd.com

What A Sight: Video Tools & Players

AVS Video Converter 3.3

We love the simplicity of AVS Media's AVS Video Converter's push-button interface. To convert an AVI, MPEG, or RM (RealMedia) video file to any of the other formats (or burn to DVD/SVCD discs), just point to your source file, choose your format, and click. If you want to trim a bit here and there or split a video file into pieces, the program has rudimentary editing tools, as well. Other programs offer more control and detail, but nothing makes video conversion so easy. (Shareware; \$29.95)

www.avsmmedia.com

Fraps 2.2.5

Forget about running tortuous 3D benchmark routines. Just load beepa's Fraps, the program that superimposes the



Fraps 2.2.5

current frame rate in a corner of your actual gameplay screen, can save benchmark stats to file every second, and even takes in-game screenshots (DirectX 9 is required). But the coolest function records your own heroic gaming exploits to a video file at up to 30fps, just in case no one in your office believes you can take out a room of Doom zombies in under three seconds. No, really, guys, we can. (Shareware; \$29.95)

www.fraps.com

GSpot 2.5

Downloaded video files often fail to play because of a missing codec or play only the audio without the video. Alas, most media players are too dumb to tell us precisely which codec the file wants. GSpot analyzes any audio and video file, as well as your system for the codecs you already have, the media types they play, and where the drivers live on your system. Point it to any file to discover the compression scheme it needs. (Freeware)

www.headbands.com/gspot

ImageResizer

For digital camera buffs that end up with folders filled with 1,600 x 1,200 poster-sized snapshots, this oft-ignored Microsoft WinXP Power Toy is indispensable. Install it on your system to add a new Resize Pictures command to the context menu for almost all image file formats. The tool lets you instantly resize the image to the most common resolutions (even PDA-sized) or pick custom dimensions. Aspect ratios and image quality remain pristine, and you don't even have to load your photo editor. (Freeware)

www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.mspx

PowerStrip 3.5

This is still the must-have tool for graphics card addicts who want optimum control over their card's memory and GPU speed, refresh rates, and color and gamma settings. You can turn any of these tweaks into profiles to run with specific programs and games. En Tech's PowerStrip scratches the tweaking itch every PC nut has. (Shareware; \$29.95)

www.entechtaiwan.com

Rage3D Tweak

For ATI Radeon card owners, this comprehensive tool is an indispensable add-on to the Catalyst video drivers that has its own tabs in Display Properties. It lets you drill into and adjust every imaginable video setting. The overclocking tool ramps up both GPU and memory clock speeds. There are scores of customizable display modes that go way beyond the standard

Windows settings, and Rage3D also lets you make game-specific profiles. (Freeware)

www.rage3d.com

Red Eye Remover

The one image-editing tool most digital photographers need is red-eye correction, and Vicman Software's Red Eye Remover is a dedicated tool that does this and only this. You highlight the pupil area and use a slider to adjust the level of correction. Another option lets you darken the pupil, as well. It does a great job and spares us the effort of having to drill into the labyrinthine menus of our full-featured photo-editing software. (Shareware; \$19.95)

www.vicman.net

What's That Sound: Audio Players & Tools

#1 Sound Recorder

This audio-grabbing software will record from any source, including streams from the Internet, games, movies—anything that is running and making sound on your PC. The simple interface lets you choose the input channel (including what you hear for audio streams), and the recorder builds a library of WAV files, which it can convert to MP3s, as well. A-One Software's #1 Sound Recorder is great for recording Webcasts or just grabbing cool audio bits from any DVD. (Shareware; \$29.95)

www.aonesoft.com

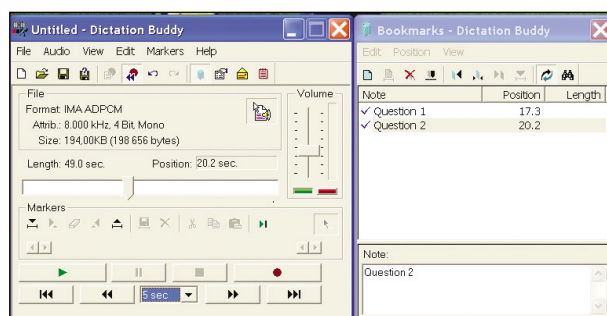
dBpowerAMP Music Converter

Samit's audio format converter of choice, the dMC can rip a CD into countless audio formats, from MP3 to Ogg Vorbis, FLAC, AAC, and many others via downloadable codec plug-ins. Converting among these many formats is as simple as right-clicking one or more audio files and accessing dMC's many conversion options from the context menu. You can even up-convert two-channel sources into four and 5.1 channels and apply volume leveling. For the Ogg converts among us who still have a library of MP3s, dMC is indispensable. (Freeware)

www.dbpoweramp.com

Dictation Buddy

With a microphone or phone adapter plugged in to your mic jack, a PC can become a sophisticated dictation machine. High Criteria's Dictation Buddy takes this input and lets you bookmark the recording



Dictation Buddy

to relocate important points of conversation or add typed notes. You can slow down the playback for easier transcribing and speed it up to find the right passage quickly. A great usability feature here are the hot keys, which let you control Dictation Buddy while transcribing in another program, so your hands never need to leave the keyboard. (Shareware; \$32.95)

www.highcriteria.com



foobar2000

Why wait for the massive Windows Media Player or MusicMatch to load every time you want to play a tune when the memory-efficient foobar2000 by Peter Pawlowski pops up faster than a context menu? This open-source player handles all of the major audio formats, and a community of developers writes numerous plug-ins to play back a wide range of more obscure file types for those who like living on the cutting edge of audio codecs. More than slim,

foobar2000 also has an awesome 18-band equalizer and uses the ReplayGain standard to level volume across various MP3s. (Freeware)

www.foobar2000.com

MediaMonkey 2.2

Our favorite bargain of the audio player world is also designed for power digital audiophiles. In addition to playing, burning, and transferring all of the usual formats, MediaMonkey also converts tracks across MP3, OGG, WAV, AAC, and other formats via plug-ins. But we like its tagging smarts. It detects files with incomplete tags and fills in their blanks

using available file name information. The Monkey even knows when to go to sleep; it can shut down your PC after completing a playlist. Good monkey! (Shareware; \$19.95)

www.mediamonkey.com

Natural Voice Reader

Tired of text-to-speech tools that make everything sound like Stephen Hawking? Natural Voice Reader's free version is not much of an improvement, but the upgrade to the Professional version (\$39.50) does boast astonishingly clear computerized voices. This freeware does let you block any text in the Web browser or application for reading or even saving to disk as an audio file, from the context menu. Voice speed is adjustable, and even in the free versions, the cadence is very natural. We're edging closer to PCs sounding like the Hal 9000. (Freeware)

www.naturalreaders.com

Noise Maker

Frankly, we'd rather be at the beach, and the oddly effective Noise Maker from Icegiant Software actually takes us there. It literally makes the sound of waves breaking along the sand. Even stranger, it has four different settings, with the sounds of bay, gulf, and ocean waves (yes, they are different). The Pink Noise option is a hiss designed to blot out other background sounds. Actually, that one sounds like

irritating static, but the waves are believable and soothing . . . really. (Shareware; \$5)

www.icegiant.com

What's On Your Hard Drive?

Pete's picks run under the Linux OS. For these and more hot Linux tools, see "Penguins, Anyone?" on page 58.

- less: power file viewing
- grep: string searching

Pete Loshin



Wired Tools: Internet

AI RoboForm Pro 6.0

When the Autofill option in the Google toolbar is not long enough for all of the sweepstakes entries, registrations, and credit card info you fill into Web-based slots, Siber System's AI RoboForm Pro is the ultimate form filler. Not only do you put in all of your personal and financial information just once, but you can create multiple identities, save logins and passwords as you enter sites, and keep all your personal information password protected. The depth of information here is extraordinary, and all of the functionality is available directly from the browser toolbar. (Shareware; \$29.99)

www.roboform.com

Firefox

If you give one alternative to IE a try this year, let the brilliant Firefox be the one. With a tabbed display of multiple Web sites, integrated Google searching, protection from malicious ActiveX invaders, add-in modules, and a small footprint to boot, Firefox makes IE look and feel like a bloated rhino. It handles bookmarks and downloading better and just performs better overall. Microsoft should save themselves a lot of time and money and simply adopt Firefox as Windows' native browser. As if! (Freeware)

www.mozilla.org

Flash Saving Plugin

If you've ever seen a Flash movie online that you just had to keep for

posterity or wanted to play when offline, this IE add-on is a must-have. UnH Solution's Flash Saving Plugin adds a button to the IE toolbar and a context menu item that brings you a gallery of Flash programs currently on a given Web page. You simply check off the ones you want to save to a designated directory, and they are on your hard drive for replaying anytime. (Freeware)

www.unhsolutions.net

Gaim

You got Gaim? You need it if you are juggling multiple IM clients like AIM, Yahoo, MSN Messenger, ICQ, etc. because Gaim puts those and other IM accounts into a single client with a consistent interface. While it is not as robust as any one of the major clients it embraces, Gaim lets you log on to multiple IM accounts simultaneously, have sound cues for events, and post keep away messages, and the programmers are working on file transfers. (Freeware)

gaim.sourceforge.net

NewsLeecher

If you can't get enough of downloading images, videos, MP3s, and such from binary newsgroups, then NewsLeecher is a great special-purpose Usenet tool, and one of Samit's favorites. In addition to downloading and reassembling multipart binaries, the program can leech from multiple servers at once and keep up to 99 download threads open for ultrafast executions. The built-in file manager, along with the latest codecs, ensures that you will be able to decode and view whatever you download. (Shareware; \$34.95)

www.newsleecher.com

Protected Storage PassView 1.61

How many usernames and passwords have we had to make in our years of traveling the Web? Clearly too many to recall, and that is where NirSoft's Protected Storage PassView comes in. The free tool decrypts and retrieves in one spot all the stored passwords and AutoComplete data that have been recorded in your Outlook, Internet Explorer, and MSN Explorer programs. Recommended by Chris Pirillo,

PassView lets you search its archives and save and export listings. (Freeware)

nirsoft.mirrorz.com

Star Downloader

Download managers are notorious for including ads and spyware, but both Star Downloader's free and fee versions are clean of ads and simple to use. They integrate with major browsers and open

Top Download Sites

Our favorite ponds for freshwater file fishing:

ASPShareware.org. The home site of the Association of Shareware Professionals maintains a huge library of shareware written by association members, some of the best and most reliable programming available.

downloads.asp-shareware.com

Download.com. CNET's venerable and well-stocked file library has numerous user ratings and staff reviews to guide you.

www.download.com

Jumbo.com. An old standby is still here, with user ratings and a lot of novel shareware and freeware.

www.jumbo.com

MajorGeeks.com. By geek, for geek, the Major is one of the best sources for obscure and single-purpose software.

www.majorgeek.com

SharewareJunkies.com. This site is distinguished by its candid reviews of all the titles in the library.

www.sharewarejunkies.com

Tucows. Another longstanding downloader favorite, Tucows has libraries for Windows, Linux, and Mac, as well as an online store for buying registered copies of many programs directly through them.

www.tucows.com

multiple streams and mirror sites to download much faster. You can also pause and resume a session or just schedule a download to execute later. Even with broadband connections, Star Downloader can accelerate downloads from otherwise sluggish sites. Star Downloader Free is an older, less feature-rich version but also ad-free. (Shareware; \$19.95)

www.stardownloader.com

Let's Be Safe Out There: Security

AbsoluteShield Internet Eraser Pro 3.38

The final solution for total paranoia. Costing less than many privacy protectors but with a user-friendly interface that covers all of the bases, we like Internet-Track's AbsoluteShield Internet Eraser Pro's comprehensive approach to wiping traces of your online and offline PC activity. In addition to the usual (browser cookies, history, etc.), this program also eliminates file run histories in most common applications, erases saved passwords and usernames, and even cleans your Windows swap file of incriminating traces. A built-in scheduler lets you automate the clean ups. (Shareware; \$34.95)

www.internet-track-eraser.com

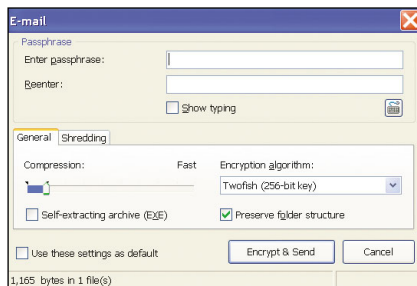
AppProtector XP

Ax-Soft's AppProtector XP lets you password protect any program to keep prying eyes out of your executables. The program integrates with Windows itself, so once it is installed, simply right-click the executable you want to secure and use the context menu to activate your new Lock command. Assign the executable any password, and henceforth you will need it to open the program. This ensures that nobody sharing your computer can mess up your Sims game. (Shareware; \$9)

www.ax-soft.com

DigiSecret Lite

This is one of the most intuitive encryption tools we have used. TamoSoft's DigiSecret integrates with the Windows interface, so you can send any file to this



DigiSecret Lite

Desktop lockbox where it is both compressed and encrypted (including a 448-bit key). You can turn the archive into a password-protected storage bin or an executable that can be passed on to colleagues for self-extraction. Files can be encrypted, password protected, and emailed to a colleague, all from the context menu. Now you'll have to find some other reason to be paranoid. (Shareware; \$29)

www.tamos.com

Microsoft Baseline Security Analyzer 1.2

If Windows is destined to be insecure, then at least Microsoft can tell us where the holes are. MBSA runs a full body check of your Windows configuration, looking for common weaknesses such as using too simple passwords, maintaining guest accounts, or finding programs such as WMP and IE that lack the latest security updates or have been set to low security levels. Best of all, MBSA issues a report that lets you click through to detailed explanations of security flaws. The new version adds support for Office applications. (Freeware)

www.microsoft.com/technet/security/tools/mbساهome.mspx

Mutilate File Wiper 2.9

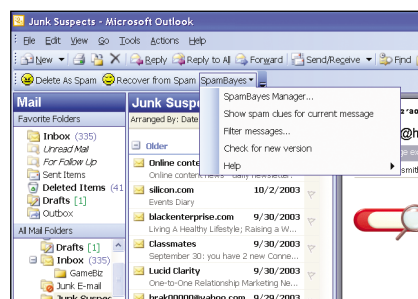
It has a creepy name for software, but Craig Christensen's Mutilate File Wiper is a simple and straightforward tool for permanently wiping files from your hard drive so that they cannot be reconstructed by snoops (or divorce lawyers). It offers four levels of erasure, including a custom level for deep paranoids that distorts old data up to 297 times. The Power Mutilator lets

you tag multiple folders for genuinely disintegrating "deleted" files across the hard drive. Forget the name; get the program. (Shareware; \$20)

home.att.net/~craigchr/mutilate.html

SpamBayes

For Outlook 2000 or later (not Express) and many POP3 and IMAP clients, SF Project's SpamBayes is a free, open-source spam segregator for those who want optimum control over their email filter. The program puts all of your email into an Unsure folder where you train it to distinguish your spam from ham (the good stuff). What we like most about this alternative spam-killer is the community of developers who offer new scripts and antispam strategies. Mike Magee says, "It's top-notch at cutting



SpamBayes

down the detritus. It's free and always will be." (Freeware)

spambayes.sourceforge.net/index.html

SpywareBlaster 3.2

Unlike spyware cleaners, Javacool Software's SpywareBlaster actually blocks the most common ActiveX tricks used by Web pages to plant these culprits on your system but also lets most legitimate ActiveX controls through without having to give special permission. A system snapshot tool lets you restore a badly infected PC to its former, cleaner state. Javacool's online database indexes the latest ActiveX controls used by these invaders, and it keeps SpywareBlaster updated. Mike Magee uses it along with a standard spy cleaner to help immunize his system. (Freeware)

www.javacoolsoftware.com

ON YOUR LOCAL SHELVES:

The Mainstream Utilities You Shouldn't Overlook

by Wallace Wang

You can seemingly download just about any utility from the Internet, but there's something comforting about having an actual box, printed manual, and CD from a brand-name company in front of you. With so many companies now competing for your money, here's a run-down of the most popular utility programs you'll find at a store near you.

Antivirus

McAfee VirusScan 8.0

VirusScan packs a powerful punch in a file size that's one-third that of most competing programs. It also integrates with Outlook and Windows Explorer, scans email and instant messaging attachments, and detects spyware and dialer programs that can take over your computer. You can also share your virus findings with other users to display a world map that shows the biggest virus threats in different parts of the world. The University of Hamburg (<http://agn-www.informatik.uni-hamburg.de/vtc>) rated VirusScan "perfect" in its latest comparison tests of 10 antivirus programs. VirusScan may have lost some marketing luster to Norton, but it still retains a technical edge. (\$59.99)

www.mcafee.com

Symantec Norton AntiVirus 2004

With its highest security settings turned on by default, AntiVirus 2004 automatically protects against viruses, Trojans, and worms in email attachments

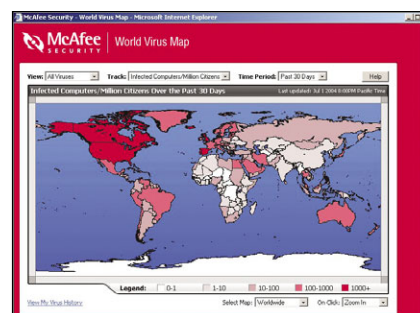
and compressed files, plus any fixed and removable drives. New features include scanning file attachments from instant messaging services; detecting spyware, keystroke loggers, and hacker tools; and blocking worms from spreading through email attachments. To combat piracy, AV 2004 contains a product-activation feature, which has caused the program to stop working on some computers. Still, AV 2004 offers maximum protection with minimal setup. (\$49.95)

www.symantec.com

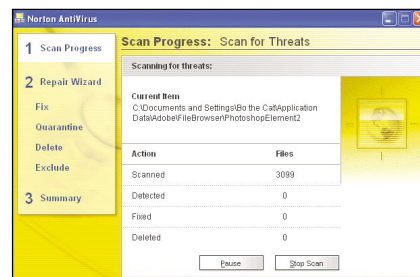
Backup

Dantz Retrospect Professional 6.5

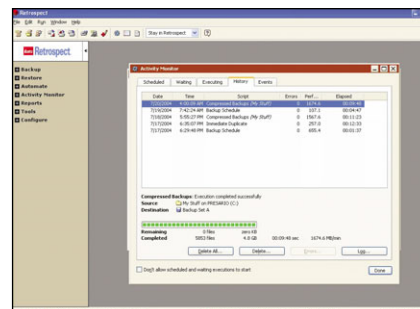
Retrospect makes it easy to schedule automatic backups to CD/DVD or tape drives, removable drives, or additional hard drives. The program lets you make exact duplicates of files or special, compressed backups. You can back up documents and also back up drivers, programs, and your operating system files and settings. To make automating backups simple, the program includes a special EasyScript Wizard that guides you



McAfee VirusScan 8.0



Symantec Norton AntiVirus 2004



Dantz Retrospect Professional 6.5

step-by-step in defining what to back up, where to save it, and how often to do it. A program like Retrospect is a bargain at any price, especially when it saves you from an inevitable hard drive crash or user error. (\$129)

www.dantz.com

FarStone SecurePC 5.0

If Windows crashes, you don't want to waste time reinstalling it and all of your settings. SecurePC prevents this by backing up your entire hard drive, data, programs, and operating system settings and storing them as a disc image on a hidden partition on your hard drive. If you lose a single file or wipe out an entire hard disk, SecurePC can restore your operating system, programs, settings, and data files back to your hard disk. For added security, the program also lets you save your disc image to a CD, so in the rare case the hidden partition on your hard drive also is corrupted, the program can restore your computer using the settings on the CD. For peace of mind, SecurePC offers quick, painless, and comprehensive backup protection. (\$39.99)

www.farstone.com

CD/DVD Utilities

Ahead Software Nero 6 Ultra Edition

Ultra Edition lets you burn data, music, and video to CD/DVD. In addition, Nero includes programs for playing audio and video files, creating slideshow presentations, editing audio and video, ripping audio from CDs in MP3 and other file formats, and converting tape cassettes and vinyl records into digital data. The suite consists of numerous programs that all seem to sport different user interfaces and offer overlapping features. Thus, this version's inclusion of a StartSmart menu is helpful because it lets you choose a task to accomplish, and Nero helps figure out the best program to use. (\$99.99)

www.nero.com

Roxio Easy Media Creator 7

Besides burning data and music to CD/DVD, Easy Media Creator can also

edit and play sound and video, create disc labels, organize pictures as slide-shows, and copy CDs/DVDs. One nice feature is its ability to format a rewritable CD/DVD so you can drag and save files to it like a giant floppy disk. Another useful feature is a special capture program to make retrieving video and photographs from scanners, digital cameras, or camcorders simple and painless. Roxio now offers a Creator Classic user interface for users familiar with previous versions of the program. If you skip the cramped and sometimes confusing Creator Classic UI, you can load Roxio programs individually. (\$99.95)

www.roxio.com

Disk Utilities

Iolo System Mechanic 4

System Mechanic offers numerous features for a low price other programs can't match. To fix problems, the program can optimize and compress the Registry. To prevent problems, it can block pop-ups and delete spyware and let you schedule routine maintenance. To free up space, SM4 can delete duplicate and junk files, such as temporary files that programs create but never delete on their own. To protect your privacy, the app can clean up Internet cache and recently loaded documents and securely delete files. If you want to speed up your computer, the program can defragment your hard drive and RAM to make your computer run more efficiently, plus adjust your Internet connection settings to optimize your Internet speed. SM4 can also tweak your Windows settings to manage which programs automatically start and customize how Windows works, such as alphabetizing your Start menu. Norton SystemWorks is great, but System Mechanic is better. (\$49.95)

www.iolo.com

Symantec Norton PartitionMagic 8.0

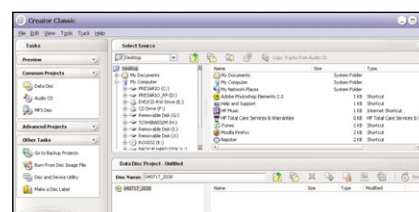
PartitionMagic is a power tool for power users, but it's simple enough for less-experienced users, as well. The program can divide a large hard drive into two or more partitions, which makes the drive



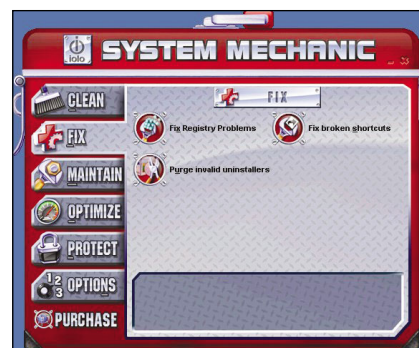
FarStone SecurePC 5.0



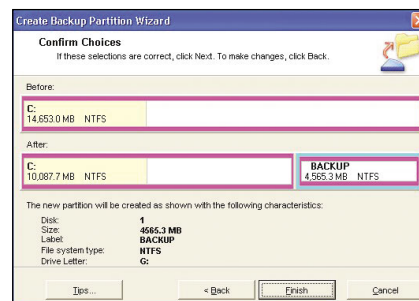
Ahead Software Nero 6 Ultra Edition



Roxio Easy Media Creator 7



Iolo System Mechanic 4



Symantec Norton PartitionMagic 8.0

run more efficiently because it spends less time searching for data in a smaller space. It can also isolate data, so if you store your OS in one partition and your programs and data in another, a Windows crash will only wipe out one partition and leave your files in the other partition untouched. If you store multiple OSes in their own partitions, PartitionMagic lets you choose which OS to boot every time you turn on your computer. Only advanced users are likely to partition their hard drives, but PartitionMagic makes it easy for anyone. (\$69.95)

www.symantec.com

Symantec Norton SystemWorks 2004

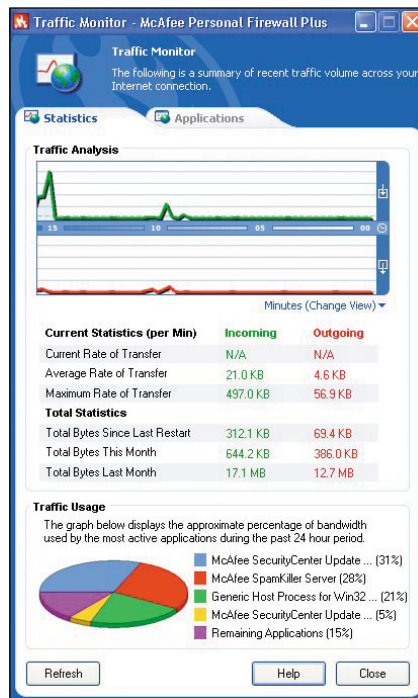
SystemWorks 2004 is the kind of package every user should have. It contains Norton AntiVirus, Utilities, and CleanSweep, which, combined, go way beyond just disk-utility functions. Norton Utilities can defragment your hard drive to optimize performance, securely delete files, and fix numerous problems with the Windows Registry. CleanSweep can delete temporary files, clean out your Internet cache, uninstall programs cleanly, and remove ActiveX and browser plug-ins. More importantly, CleanSweep can also back up your programs, so if your hard drive crashes, you won't lose any programs you bought and installed over the Internet. Although SystemWorks lacks a Registry optimizer and defragmenter, it offers so many necessary features for a reasonable price that it's hard to pass up. (\$69.95)

www.symantec.com

Firewall

McAfee Personal Firewall Plus 5.0

Many users have no idea why they shouldn't let every program on their system run. Thus, they unwittingly let potentially dangerous files run wild despite warnings from their firewall. To prevent this, McAfee's Personal Firewall Plus includes a Smart Recommendations feature that can recognize common programs and automatically grant them Internet access. This way users don't get a constant stream of false alarms every time



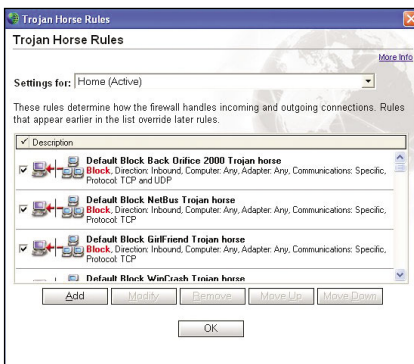
McAfee Personal Firewall Plus 5.0

their browser or email client accesses the Internet. Further, the program can display which programs have used the Internet and for how long so that you can see if a suspicious program has been gobbling up bandwidth. Although the program won't block pop-up ads like other firewalls can, Smart Recommendations ensures that it stays out of your way as it protects your computer. (\$49.99)

www.mcafee.com

Symantec Norton Personal Firewall 2004

Personal Firewall offers basic firewall protection by shutting down ports that



Symantec Norton Personal Firewall 2004

are seldomly used and challenging every program that tries to access the Internet. To make things easier for novices, the app includes predefined rules that let certain types of Internet connections occur while blocking more suspicious ones. For further protection, the program can block the most common RATs (remote access Trojans) that can infect your computer and attempt to leak your information over the Internet. Integrating itself into Internet Explorer, Personal Firewall remains accessible while you browse so that you can quickly block pop-ups or cookies from select Web sites. For laptop users who switch from a business network to a wireless network, the program can automatically adjust its settings when it detects a new network. With smooth integration among other Norton products, Personal Firewall is a must for users who use Symantec products. (\$49.95)

www.symantec.com

Zone Labs ZoneAlarm Pro 5.0

For all-around Internet-related protection, few programs equal ZoneAlarm Pro. Not only can it shut down open ports, but it can also individually allow or deny Internet access to specific programs. The program's additional defenses include email scanning for viruses and worms, a pop-up stopper, an Internet cache and cookie cleaner to protect your privacy, and a hacker ID feature to pinpoint where hacker attacks may be coming from. If you're using Norton, McAfee, Trend Micro, or Computer Associates' antivirus programs, ZoneAlarm Pro can inform you when your antivirus program needs updating. (\$49.95)

www.zonelabs.com

Spam/Pop-ups/Spyware

McAfee SpamKiller

SpamKiller wipes out spam from Hotmail and programs such as Outlook and Outlook Express by studying the content and headings of an email using predefined filters, which McAfee constantly updates. When the app identifies spam, it can automatically delete it or

return a phony error message to fool spammers into believing the email account is invalid. SpamKiller can recognize most spam upon installation, and it can also teach itself to identify spam by analyzing the types of messages you route to your spam folder and which ones you rescue. SpamKiller can also block or accept spam from specific addresses, but be prepared to customize it to do this automatically. (\$49.99)

www.mcafee.com

Panicware Pop-Up Stopper Professional

Pop-Up Stopper Professional not only works with almost every browser—including Internet Explorer, AOL, Opera, Netscape, and Mozilla—but it also cleans your Internet and Windows cache folders. The program can play a sound or display a message when it blocks pop-ups, and if you want to see a pop-up, you can temporarily disable the program by pressing CTRL or permanently disable the program for certain Web sites by storing the domain names in a list of acceptable sites. Best of all, the program includes free updates to keep the protection up-to-date. Pop-Up Stopper Pro is what every program should be: inexpensive, unobtrusive, and reliable. (\$39.95)

www.panicware.com

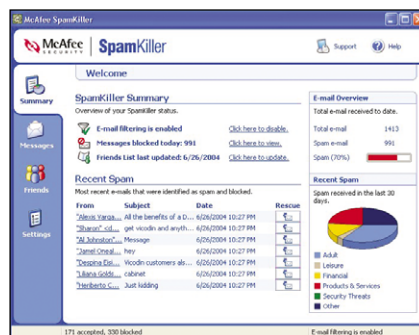
Symantec Norton AntiSpam 2004

When you install Norton AntiSpam, it integrates itself into Outlook, Outlook Express, or Eudora and starts routing suspected spam into a special folder. To fine-tune the program, you can create a list of trusted addresses that you always get email from or create a list of blocked addresses to prevent you from getting mail from spammers. For more protection, the program analyzes your outgoing messages to adjust its filters to block spam without your intervention. For a program that filters spam with little attention from you, AntiSpam is a good choice. (\$39.95)

www.symantec.com

Webroot Spy Sweeper 3.0

Spy Sweeper gets rid of spyware, plus sweeps your system clean of keystroke



McAfee SpamKiller

loggers and Trojans. Because spyware can sneak into your computer just by you visiting a Web site, the program can proactively block spyware from installing itself. To further protect against malicious code that may have been already installed on your computer, Spy Sweeper displays a list of those programs that start up automatically, letting you see which applications should start up automatically (such as your firewall) and which ones should not. (\$29.95)

www.webroot.com

Others To Consider

Scansoft Dragon Naturally Speaking 7 Standard

Not necessarily a utility, but it lets you control your computer through voice-activated commands. (\$99.99)

www.scansoft.com

Ideasoft iClean Internet Privacy Protector

Removes cookies and Internet cache files to prevent others from tracking your movements online. (\$9.99)

www.ideasoft.com

Scansoft PDF Converter 2

Converts noncopy-protected PDF files into Microsoft Word files for easy editing and modification. (\$49.99)

www.scansoft.com

Microsoft Virtual PC 2004

Again, not really a utility, but VPC runs multiple OSes within Windows. (\$129)

www.microsoft.com

The Utilities That Are Selling

We wanted to know which utilities users are snatching up the most. Here's a list of the best-selling utilities as of mid-August, according to Graphics Unleashed (www.unleash.com/picks/software/topsoftwareutilities.asp).

Ranking Software Title

- 1 Symantec Norton AntiVirus 2004
- 2 Symantec Norton Internet Security 2004
- 3 iClean Internet Privacy Protector
- 4 Trend Micro PC-cillin Internet Security 2004
- 5 McAfee VirusScan 8.0
- 6 Adobe Acrobat 6.0 Standard Edition
- 7 Ahead Software Nero 6 Ultra Edition
- 8 Symantec Norton SystemWorks 2004
- 9 321 Studios Games XCopy (Out of business)
- 10 Adobe Acrobat 6.0 Professional Edition



PENGUINS, ANYONE?

Linux Utilities To Decorate Your Distro



by Pete Loshin

When it comes to utilities, the Linux community churns them out like nobody's business. Whether you are new or old to the Linux game, here is a group of Linux utils you'll want to check out and maybe just add to your favorite distribution.

Communications

KSSH

Sometimes it's nice to have a GUI front-end for console apps, especially when you have to rely on the app for security, as with SSH (Secure Shell). KSSH does the job. It has a nice panel for picking and choosing from hosts and userIDs and lets you set options for your standard terminal screen SSH session.

kssh.sourceforge.net

Lynx

Eventually you'll need to rescue a system and have to boot without a desktop GUI.



The Web is surprisingly usable in text-only mode when you have Lynx running in a console.

Having a text-only Web browser, such as Lynx, that runs from the command line will be handy. It won't run Java or Flash movies or any other snappy graphical stuff, but you can access help or search sites just fine.

There's also built-in help and intelligent tools for dealing with things such as cookies.

lynx.isc.org

Red Carpet

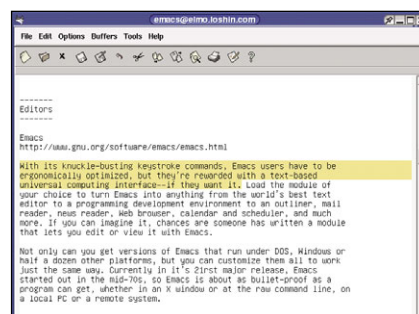
When Novell bought Ximian for GNOME, it also got Red Carpet, a brilliant utility service for upgrading and patching software. Red Carpet detects your installed software and indicates which programs need updating. It can then update the packages you select. Novell also bought SUSE Linux, which defaults to KDE, so Red Carpet works fine even if you don't use GNOME on your desktop.

www.novell.com/products/desktop/update.html

Editors/Viewers

Emacs

With its knuckle-busting keystroke commands, Emacs gives you a universal text-based computing interface. Load the



Emacs offers incredible versatility whether you run it from the command line in text-only mode or in its own GUI window.

module of your choice to turn Emacs into anything from the world's best text editor to a programming-development environment to an outliner, mail reader, newsreader, Web browser, calendar and scheduler, or more. If you can imagine it, someone has probably written a module that lets you create, edit, or view it with Emacs. Various versions run under DOS, Windows, and other platforms, and you can customize them all to work alike. Emacs is in its 21st major release and is bulletproof whether you run it in an X window or at a command line on a local PC or a remote system.

www.gnu.org/software/emacs/emacs.html

GIMP

Photoshop Elements is more or less free with the right hardware bundle, but

for years Linux users have been stuck using GIMP 1.2 for image editing—not a bad thing, but 1.2 needed work. With the bug-fixed, feature-rich GIMP 2.0, GIMP is a world-beater for graphics editing.

www.gimp.org

jEdit

A Java-based editor such as jEdit may be just what the computer/human-interface specialist ordered. Java means jEdit runs on any system with a Java virtual machine. jEdit also supports complex macro writing with the BeanShell (www.beanshell.org) Java-scripting language. If you prefer keyboarding to mousing, you will love jEdit's keyboard commands for selecting and manipulating text and window splitting. More than 80 plug-ins turn jEdit into anything from an IRC client to an FTP-aware editor, and if you can't find what you want, you can always write your own.

www.jedit.org

Kbarcode

Let's face it; getting text output to a printer is pretty easy. Barcodes are harder because you can't always tell if you have them right just by looking at them. Kbarcode makes it easier, even if nothing is likely to idiot-proof the process of printing labels or other nonstandard output. If you're using GNOME, you might opt for the highly touted latest version of gLabels (glabels.sourceforge.net), but with so many leading Linux distros defaulting to the KDE (K Desktop Environment), you may want to settle in with KDE and related applications such as Kbarcode.

www.kbarcode.net

TuxCards

According to developer Alexander Theel, TuxCards is a "hierarchical note-book," which could mean "glorified outline program." To loyal users, however, TuxCards is a fast and easy tool for writing, storing, and retrieving detailed, hierarchical notes. TuxCards sports encryption and entry history to recall the most recently visited notes. You can even create notes with an expiration date. There are similar

programs, but TuxCards is simplicity personified, with just enough features to make it useful but not so many to make it unwieldy.

www.tuxcards.de

Xpdf

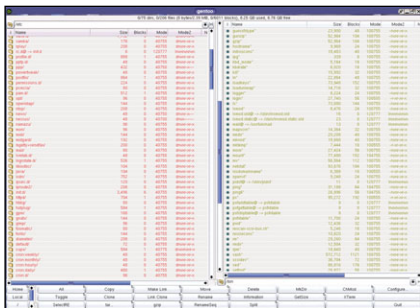
Adobe may own the PDF format, but Xpdf beats Acrobat when you need to read or print a PDF file fast. Glyph & Cog wrote this awesome utility and publish it under GPL. There are no fancy options here, just view, print, search, and size documents on-screen. The Xpdf project includes such utilities as a PDF-text extractor, while other projects based on Xpdf include PDF2SWF (www.quiss.org/swftools) for incorporating PDF files into Flash animations and PDFTO-HTML (pdftohtml.sourceforge.net) for converting PDF files to HTML.

www.foolabs.com/xpdf

File Managers/Browsers

gentoo

Power users who want the fastest, most adaptable file manager for X Window sessions will like the gentoo file manager. Few GUI apps offer a similar degree of mouse control; click a selection and you get valid options for your selection, from



Highly intuitive, supremely configurable, and fast, gentoo offers the best of GUI and shell-file management.

mounting a file system to viewing the contents of an archive file or running an executable. Don't like how gentoo does something? Reconfigure commands to run what you want. Wildcard file selection isn't good enough? Use regular expressions to do pattern matching. Want

to display file attributes? gentoo lets you. gentoo is fast, even when you're copying, moving, or deleting gigabytes.

www.obsession.se/gentoo

Konqueror

Commercial Linux distros have been leaning to KDE for some time, in no small part due to the clean, easy-to-use Konqueror file and Web browser. Konqueror is also a universal viewing app that's endlessly configurable and customizable. Configuration is the key; you can design your own toolbar with buttons for just about any browser action, including splitting the screen, adding tabs, archiving Web pages, and changing your browser identification. The file browser is just as configurable, with toolbar icons available for everything from Undo to Create Image Gallery to Show Hidden Files. With XML configuration files you can customize Konqueror for every user and any platform.

www.konqueror.org

Midnight Commander

Linux users stuck at a command line can invoke the excellent Midnight Commander for a great two-panel directory browser. View, edit, copy, rename, and about a dozen other commands are just a keystroke or two away. MC is good for handling file-management emergencies, and it can be your command line headquarters for everything from file viewing to FTP. It even has a built-in programming editor. You may not be able to browse graphical files, but MC is an important part of any text-oriented system toolkit.

www.ibiblio.org/mc

Shell Utilities

apropos

apropos is just another name for the man command with the -k option. It is for when you know there's a command for something you want to do but your only clue to its name is a file, function, or something that's related to the command itself. Run apropos with a keyword related to your suspected command and you'll get

Our Favorite Distros

Choosing Linux these days is like choosing a car: dozens of commercial and noncommercial brands to pick from, and each vendor offers more than enough packages and purchase options to make things interesting. Quoting prices is almost foolhardy, as the publishers constantly tinker with packages, releases, and features. Expect to pay as much as a few hundred for a desktop package from Red Hat or as little as \$50 (some well less than that) for an entry-level desktop distro from Mandrakesoft, Xandros, Lycoris, or Linspire.

Red Hat's Enterprise Linux now sits on the high end of the commercial distros, with premium technical support and product quality assurance, but you can also try the unsupported Fedora Core distro that Red Hat now underwrites as a development and experimental platform. Novell now owns SUSE Linux, our personal favorite, with an entry-level distro available for less than \$30 and a high-end version for about \$90.

The free field continues to grow, still led by Slackware and Debian. Slackware is billed as the "most Unix-like," while Debian aligns itself with the GNU free software philosophy. Another free distro, the Knoppix bootable-CD distro works great for demoing Linux or simply trying it out without futzing around with hard drive installation. Gentoo Linux spawned a new generation of super-customized distros by offering a platform for easily and quickly creating your own distro optimized with the apps you need.

If you're looking for something special, start at DistroWatch.com, which tracks hundreds of distros, including everything from AbulEdu (a French educational distro) to Zopix (a specialized Knoppix-built distro for Zope developers). No matter what you need, chances are someone has already built it.

a list of man pages that contain that keyword—handy for stressed-out sysadmins.

www.nongnu.org/man-db

GNU Screen

This one is for command line junkies only. GNU Screen lets you run multiple shells from any terminal. Each shell window runs independently, but you can still grab text from one session and paste it to other sessions. Another great tool for fixing systems that are graphically impaired.

www.gnu.org/software/screen/screen.html

grep

Search input for lines that contain a match to a pattern and print the lines with the matches. grep is very simple and incredibly powerful when the pattern matching uses regular expressions, when the input can be the output of some other program, and when the output can also be piped into yet another program for further processing.

www.gnu.org/software/grep

less

This from the less FAQ: "Less is a pager. A pager is a program that displays text files." Simple as it sounds, less supports backward and forward movement in each file, multiple files, and searches across one or all the open files. Like other shell commands, you can pass parameters to make less do even more.

www.greenwoodsoftware.com/less

locate & find

locate, like find, is part of GNU Findutils; it is used to search for file names matching a pattern. locate is faster because it uses a periodically updated index, but it may miss newly created files that haven't been indexed yet. locate is light-years faster than any GUI search on our favorite Linux distros; you just have to remember to install findutils for these handy tools to work.

www.gnu.org/software/findutils/findutils.html

man

When you don't know the proper syntax or parameters to pass a shell command, man (manual pager) invariably comes to

the rescue. It's a pager, like less, but is optimized for displaying documentation written for most Unix commands. It makes for endless fun at geek parties when you come up with amusing uses, such as "man kill," "man locate," or "man cat."

www.nongnu.org/man-db

sudo

sudo (superuser do) lets a sysadmin grant a user or group of users to log in as root, while logging all sudo activity. This is far safer than logging into any PC as superuser for routine sysadmin tasks such as software installation.

www.courtesan.com/sudo

System Utilities

GKrellM

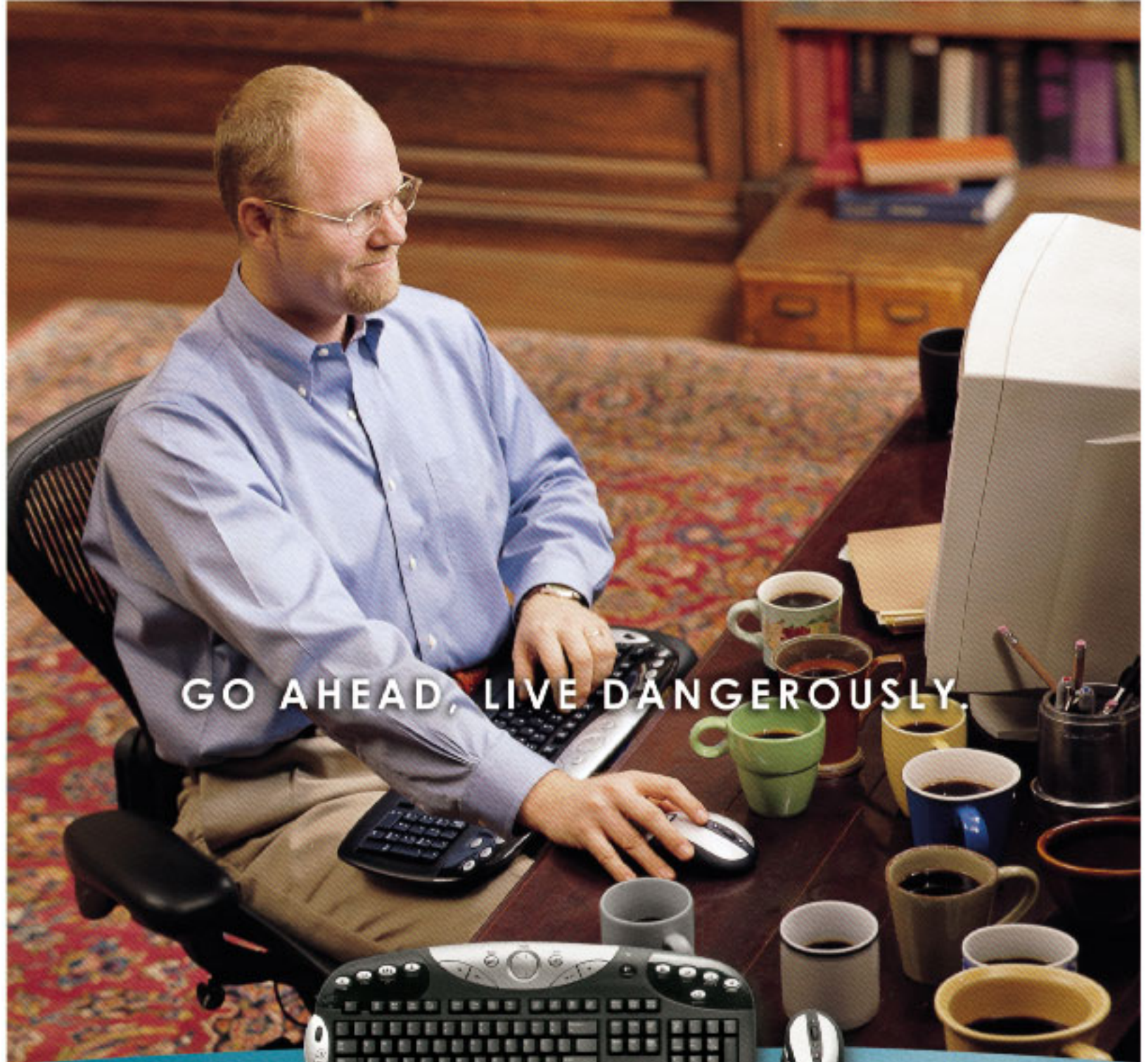
GKrellM is a graphical stack of system monitors you can customize to show just about any measurable system attribute. You can also specify what happens when your system redlines. Each monitor displays a "krell" (the name is taken from the movie "Forbidden Planet") and shows anything from CPU usage to the number of active processes, users, disk reads/writes and partition usage, and network activity. Worried about running too hot or running out of disk space? Set your own warning commands for GKrellM to execute. With more than 80 plug-ins available, you can monitor just about anything, or you can write your own.

web.wt.net/~billw/gkrellm/gkrellm.html

Klipper

Part of the KDE project, Klipper manages your clipboard contents, and it's great for cutting and pasting. Press ALT-CTRL-V in any application and you'll see the Klipper menu. Choose an entry and you're good to go. But Klipper can also use regular expressions to recognize such things as URLs or file names so that when you highlight a URL in your text editor, Klipper pops up a menu to give you the option of opening that URL in your browser. Of course, you can customize the standard strings or create your own.

www.kde.org



GO AHEAD, LIVE DANGEROUSLY.

Logitech® Cordless MX Duo™. Announcing the end of tangled mice, stuck cursors and spilled coffee. With no cords to tie you up, slow you down, or hold you back, this sleek, one-touch keyboard and advanced optical mouse give you the control and flexibility to work your way – whatever the obstacles. What will you do with all that freedom?

www.logitech.com



MAC OS X MADNESS

Utilities That Will Make Panther Purr



by Dave Taylor

Panther has a ton of cool software and capabilities built in, but there are lots of innovative developers in the Mac community. It's hard to imagine any Mac user who doesn't have at least a half dozen add-ons. Settle back, and we'll give you a tour of some of the better freeware and shareware utilities for a Mac system.

For Mac Professionals

Business Card Composer

It may be the result of watching too many episodes of "Mission Impossible," but we love designing and printing business cards. Using a combination of Business Card Composer, perforated business card stock, and a color printer, we can produce professional-quality cards for specific meetings, conferences, or more. (\$39.95)

www.belightsoft.com

disclabel

There's not much point in owning the best media center on the planet if you don't use it to build and burn CDs and DVDs. For nice-looking labels on our discs, try disclabel, which is as easy to use as it is fun. Even better, the developer continues to tweak the usability so you can avoid the earlier baffling Editor mode. (\$29.95)

www.smileonmymac.com

Palm Desktop

This utility may be one of the best-kept secrets in the Mac community. Even if you haven't touched your Palm device

in years, Palm Desktop is still a great calendar and phone book to keep around. As a bonus, if you're in a multiple-OS environment, the data is interchangeable with the Windows version. (Free)

www.palmsource.com

PDFshrink

If you send documents to other users, you know PDFs are great. One of the best features of Mac OS X is that any application can produce PDFs. But the files aren't always the smallest they can be. That's where PDFshrink comes in. Feed it a PDF file, and it'll reduce graphics to match the output medium, remove unused typefaces, and use various other tricks to reduce PDFs often by 50% or more. (\$35)

www.apago.com

Fun & Games

CrazyGolf

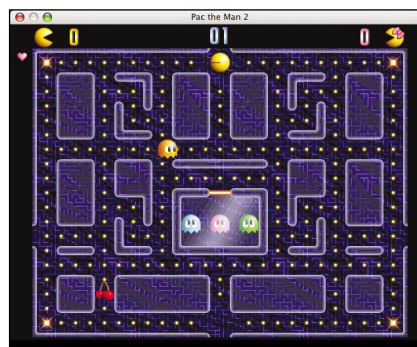
Even the biggest fans of shooters or strategy RPGs like a good miniature golf game, right? Well, let's assume you do. CrazyGolf is the best miniature golf game we've found for the Mac. For those

who've played miniature golf before, the green-only course is littered with obstacles, walls, windmills, and similar. (\$17)

www.danlabgames.com

Pac the Man 2

This little app is delicious retro fun and a surprisingly engaging version of the Namco legend Pac-Man, even down to the ghosts and audio effects. Drop it on your computer for emergency use during those boring conference calls and interminable downloads. Even better, this new version



Get your Mac game on with Pac the Man 2.

includes some beautifully rendered 3D backgrounds and much more. And it's free.

www.mcsebi.com

WeatherPop Advance

Even if you don't work in a dingy basement, it can sometimes feel like it.

Fortunately, you can always know what the weather is up to by glancing at WeatherPop Advance on the menu bar. You can also easily access a seven-day forecast and switch among forecasts for a half dozen favorite cities with a single click. (\$8)

www.glu.com

Graphical Utilities

GraphicConverter

The acknowledged leader of the Mac shareware market, GraphicConverter is included free with your Macintosh (though you still need to register it). There is little this application can't do, from converting among more than 100 different graphical formats to photo touchup to applying special image effects and filters. It's a must-have, even if you think you'll never do anything with graphics. (\$30)

www.lemkesoft.com

VueScan

When Mac OS X was released, the greatest limitation it had was a lack of support for scanners. Fortunately, VueScan stepped in to fill the gap and has continued to evolve and improve since. Today, it supports tons of different scanners and is almost always better and more capable than the software that scanning vendors ship. (\$59.95)

www.hamrick.com

ImageBuddy

Visit a portrait studio and you can order photo prints in a variety of layouts, from a single 8 x 10 to a dozen wallet images and any combination in between. With ImageBuddy you can produce identical results right on your Mac. The interface can be a bit confusing, though, so give yourself time to figure the program out. (\$19)

www.kepmad.com

HTMLColorPickerX

If you do Web design, you've probably found that it's pretty hard to identify the RGB hexadecimal value for a color you see on-screen. Some high-end graphics utilities and HTML editors include this capability, but HTMLColorPickerX does

one better by letting any application that uses the Apple Color Palettes system have the program as a new option. This means it's a breeze to figure out HTML colors and to access the so-called Web-safe color palette from within any graphics application. (\$9.95)

flip.macrobyte.net/software/HtmlColorPicker

SnapZ Pro X

Whether you're trying to debug a curious application oddity, write about software for a living, or just want to share some fun Web sites with a friend, there's no better screen-capture utility than SnapZ Pro X. We've taken thousands of screen shots with this app for different projects with nary a glitch. The latest version also lets you capture screen activity into movies. The new interface is a bit quirky with an annoying floating window, but the results are fabulous. (\$69)

www.ambrosiasw.com

Internet Utilities

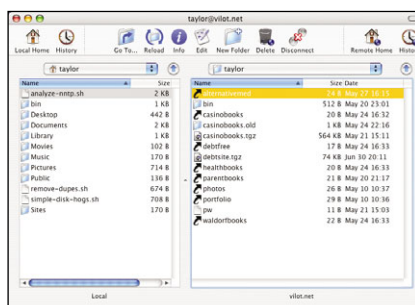
Firefox

If you're not slavishly devoted to Safari or Internet Explorer, you've already realized there's a world of choice with Web browsers on the Mac. The best of those may be Mozilla's fast, lean Firefox. An open-source product, Firefox has just about all the features of Safari and much more. It's well worth checking out if your current browser is cramping your style. (Free)

www.mozilla.org

Fugu

If you're a hard-core command line user, Terminal is probably always open on



Try Fugu for your FTP and SFTP needs.

your desktop. For uploading or downloading files via FTP or SFTP, we just use a command line program. When we need buttons and a GUI, though, there's no better choice than Fugu, which is built atop the powerful OpenSSH system already included with more recent versions of Mac OS X. (Free)

rsug.itd.umich.edu

Adium X

With the proliferation of instant messaging clients, it's possible you have iChat, MSN Messenger, and Yahoo! Messenger running. But there's a much better solution. Adium is an open-source GUI that lets you simultaneously log in to AIM, MSN, Jabber, ICQ, and others with a flexible front end and more features than you can shake a stick at. We use it every day, and it's a lifesaver. (Free)

www.adiumx.com

More Internet

For all the Mac goodness Safari is bursting with, there are some inexplicable things missing, most notably a way to associate applications and plug-ins with specific file types you encounter while surfing the Internet. A small, simple Preference Pane called More Internet offers a straightforward and useful solution. Whether it's sidestepping the recent help: exploit or just deciding which media player should get an AVI file, More Internet is a good choice. (Free)

www.monkeyfood.com

NetNewsWire

In case you've been living in a hole in the ground, RSS rocks. In fact, an RSS reader is expected to be included in the next generation of Safari. While we're waiting for that, there's no better RSS reader we know of than NetNewsWire. (\$39.95)

www.ranchero.com

Movies, Music & P2P

BitTorrent

There are plenty of alternative applications out there, but many P2P users will tell you that the best results are had with the original: BitTorrent. Be aware that

when you delve into the world of P2P, you need a lot of patience. Even with a broadband connection, BitTorrent can't speed up the numbing download times for some larger files. (Free; see page 108 for more.)

www.bitconjurer.org

DVDBackup

Many of us like to watch movies when we travel, but toting around a dozen DVDs is a hassle, and playing a DVD on a PowerBook sucks up more battery power than just reading the same movie off the hard drive. That's where DVDBackup comes in. It's a simple application, but it can also let you wander into the dark side of the Mac's media capabilities (which we're not condoning) by removing region encoding data and defeating the CSS encryption system that makes DVDs "uncopyable." Enter at your own risk. (Free)

wormintheapple.gr/macdvd/DVDBackup.html

UnRarX

Once you get into the P2P world, you'll find most available files aren't in StuffIt or Zip formats, but probably more likely RAR. Once you get RAR files, you'll be glad you have UnRarX handy. The program is a one-trick pony, as it just decodes RAR archives quickly and easily. (Free)

homepage.mac.com/pnoriega/unrar.html

VLC

We used to use QuickTime Player and DVD Player until we found VLC. An open-source video player with a Mac OS X



VLC is what we use to watch movies.

skin, it plays just about every video format you can throw at it, including AVI, MPEG-4, QT, and MOV. It can also play DivX, SVCD, KVCD, and even more-obscure video formats (though you'll need to install some codecs, which the VLC documents explain how to do). (Free)

www.videolan.org/vlc

Synergy

iTunes is always running on our computer, but even with two monitors, screen real estate is at a premium. That's where the Preference Pane Synergy is a great improvement. It adds Back, Pause/Play, and Forward buttons to the menu bar and discreetly pops up an informational window showing the matching album cover and listing artist and song title each time a new song plays. (\$7)

synergy.wincen.com

Stuff For Your Screen

DockFun!

When we migrated to Mac OS X years ago, we actually liked the Dock. Maybe it was because we had spent time with Windows and NextStep. Maybe it was just because the Dock is really cool. But there's room for improvement, which is why DockFun! is a winner. In particular, it lets you have an almost perfect Dock clone on a second monitor. (\$19.95)

www.donelleschi.com

EyeTV

EyeTV, coupled with the pricy EyeTV 200 FireWire-based MPEG-4 encoder, lets you watch TV, movies, and even TiVo on a Mac screen. The interface is quirky, and many users grumble about the setup and configuration, but once it's working it really feels like the next generation of computing. Being able to easily capture an incoming video stream, turn it into an AVI file, and burn it to a DVD makes recording your favorite shows and movies a reality. (Free; hardware required)

www.elgato.com

MoreClocks

MoreClocks lets you display a floating clock in any of about a dozen different

layouts (with independently adjustable size and transparency), and its main menu is tied to a menu bar clock, too. Click it and you get to the configuration area and a neat month-at-a-glance view. We use this utility to have a floating clock on a second monitor so we can see the time on either screen. (\$10)

regnault.luc.free.fr/MoreClocks_2.5.html

Utilities To Satisfy The Inner Geek

Terminal

Terminal isn't shareware; it's not even freeware. It's part of Mac OS X, and it lives in your Applications, Utilities folder. The app is a powerhouse because it lets you get to all the power and capabilities of the Unix command line underlying Mac OS X. It's not particularly friendly or intuitive, though, so you'll need a guide. Once you get the hang of it, however, you'll find your love of Mac OS X increases at least tenfold. (Free)

www.apple.com

Vim

Once you've popped open the Terminal, you'll eventually use the Vi Editor that's included with all Unix and Linux systems (including Mac OS X). What you might not realize, however, is that you're really using Vim, a much more powerful editor that even has a GUI available. Download it, and if you're already a Vi user, you'll be delighted to have a graphical editor that has menus, pop-up windows, and all the familiar Vi keystroke commands. (Free)

www.vim.org

Fink

As you delve further into the Unix side of Mac OS X, you may wonder what Unix-based applications are available and have been ported to Mac OS X. That's a whole other article, but there are thousands of applications available for your Mac. The application for finding and installing these Unix apps is Fink. It's well worth exploring on a rainy afternoon. (Free)

fink.sourceforge.net

NOT TO GO UNNOTICED

Scads Of Utilities For Handheld Devices



by Jen Edwards

They're often overlooked, but utilities for a handheld device can add a great deal of functionality and power. The selection below includes backup options, calculators, launchers, document and photo viewers, password managers, and other applications designed to help you get the most out of your mobile device, whether it's a Palm OS device, a Pocket PC handheld, or a smartphone.

Palm OS

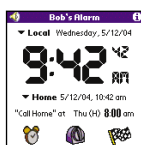
BackupBuddy 2

Data loss seems almost inevitable when it comes to computers and handheld technology. Fortunately, BackupBuddy provides a bulletproof solution to keep your handheld data safe. The app replaces the standard system HotSync conduit with a proprietary conduit that backs up everything on your Palm OS device. The latest version introduces several new features, including the ability to keep several complete backups and ZoomBack, which lets you return the device to the original state before a crash. You can also restore individual handheld databases and applications. A separate VFS version lets you schedule full or incremental backups to a memory card. (\$29.95)

www.bluenomad.com

Bob's Alarm

Bob's Alarm is a fully featured alarm, timer, and stopwatch utility. Instead of cluttering your handheld date book with reminders, Bob's Alarm can handle it all



Bob's Alarm

for you. You can set alarms to happen once, daily, or for weekdays or weekends only. You can also set a custom repeat pattern. Alarm sounds include WAV files, MIDI sounds, or "Bob's alarms," which include a claxon, warble, phone, chirp, or wolf whistle, with variable volumes and vibrations. The app is fully customizable and skinnable with various background themes, or you can personalize the display with custom color settings. Hi-res support is included, and it's possible to set Bob's Alarm to "stay on in the cradle" to use it as a desk clock. (\$9.50)

www.handango.com

or www.palmgear.com

FileMan

Palm OS handhelds don't come with a standard file viewer, so a utility like FileMan is handy. The tabbed interface lets you quickly switch between RAM and memory card views, and it's possible to view such file information as the file-creation date, creator ID, size, and type. You can beam files to another handheld or move/copy between the internal system RAM and expansion cards. You can

also create and delete directories on expansion cards. (\$12)

www.bitsnbolts.com

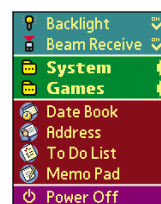
Fitaly

Fitaly is a Palm OS utility that promises you can achieve text-entry rates of up to 50 words per minute with a little practice. The secret is the design of the on-screen keyboard, which is optimized to reduce finger travel between keys. All the letters of the alphabet are included, as well as frequently used punctuation and editing symbols. A Pocket PC version is also available. (\$25)

www.fitaly.com

Hi-Launcher

Hi-Launcher is one of the most versatile Palm OS apps available. At its most basic, it provides a pop-up menu of apps you can launch from any program, meaning most users won't need to use the rather clunky built-in launcher. Hi-Launcher is completely customizable, letting you add programs to the menu or group them into submenus, similar to the Windows Start menu. You can choose the background and text color for each menu item, and Hi-Launcher includes such extras as the ability



Hi-Launcher

to turn off and lock your handheld, view memory and battery status, launch Desk Accessory app, and more. (\$14.95)

www.hi-launcher.com

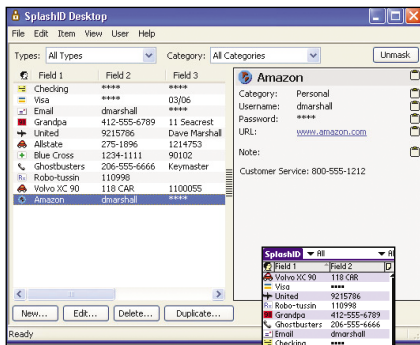
PalmaryDates

PalmaryDates lets you easily find the correct dates for holidays in the United States and around the world. It's invaluable for business travelers or anyone just curious about celebrations in other countries. You can browse holidays within PalmaryDates or export holiday information to your calendar or Memo Pad. Information is included for holidays through 2015. (\$14.95)

www.palmarysoft.com

SplashID

SplashID is a password manager that includes a handheld component and a Windows Desktop version. Features include 256-bit Blowfish encryption, customizable record types and categories, field masking, and color and icon support. A random-password generator is included, which is useful for secure environments



SplashID

where you change passwords often. You can get SplashID separately for \$29.95 or with the SplashWallet bundle (\$49.95), which includes a photo viewer, shopping list manager, and a personal finance app. SplashID is also available for Pocket PC, Microsoft Smartphone, Symbian UIQ, and Series 60 smartphones.

www.splashdata.com/splashid/index.htm

TextPlus

TextPlus is a word-completion utility that speeds up text entry by guessing what

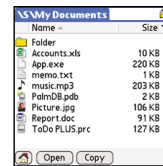
word you're entering on your handheld. The app includes a large list of words and phrases, but you can add your own entries to the built-in dictionary by single- or double-tapping a word or phrase in any Palm OS application. Frequency-based suggestions mean that the more you use TextPlus, the better it works for you. (\$19.95)

www.smartcell.com

WiFile

WiFile lets any Palm OS 4 or 5 device with an Internet connection wirelessly access files on corporate networks and home computers (including Windows, Mac, and Unix systems). It works with VPN software, plus such apps as Documents To Go and Quickword. WiFile works with a Wi-Fi or Bluetooth connection and can save changed documents back to the network. (\$29.95)

www.handshigh.com



WiFile

Pocket PC

Conversions In Hand

Conversions In Hand is the ultimate unit-conversion utility for Pocket PC handhelds. It includes more than 200 conversion types, including measurement, volume, clothing size, and "days until" calculations. There's also a built-in calculator and an option to quickly and easily download currency conversion rate updates from the developer's site. A desktop companion edition is included with purchase. (\$18.99)

www.burroak.on.ca/cih.html



Conversions In Hand

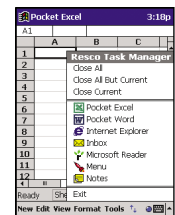
text-editing functions. Stylus mode takes up less screen space but requires using a stylus. The Finger mode features a larger keyboard. The app is also available for Palm OS devices and Tablet PCs. (\$29.50)

www.messageage.com

Resco Utility Package

This package includes Resco Picture Viewer & Desktop Optimizer, Resco Explorer 2003, and Resco Task Manager. Picture Viewer supports various popular image formats, including BMP, GIF, JPEG, and TIFF. It can also create photo albums and slideshows, view faxes, and even play movie files in MPEG-1 or MPEG-2 formats. Explorer is much more advanced than File Explorer for the Pocket PC, letting you view, encrypt, or compress any file on the device. A network browser and Registry editor are also included. Task Manager provides a quick way to switch to or close any open application, which is a definite improvement over having to navigate through menus to close apps and free up memory. The apps are available separately, but the bundle offers a substantial savings. (\$29.95)

www.resco-net.com/utilpack.asp



Resco Utility Package

ScreenOff

ScreenOff is a 5KB utility that simply turns off your Pocket PC's screen. This is particularly handy when playing MP3s, as the screen isn't generally necessary to listen to music. Thus, you can save substantial battery life. The app works on Pocket PCs with an ARM or SH3 processor, and it works best when you assign it to one of the device's hard buttons. (Freeware)

www.pocketgear.com/software_detail.asp?id=14498

Spb Full Screen Keyboard

This app makes fast text entry without a stylus possible on Pocket PCs. It features large keys that you can type on with your fingers, plus it offers word completion and customizable key-press sounds. You can

skin the app, and it's available for several different languages. (\$9.95)

www.spbsoftwarehouse.com/products/fsk/?en

Spb PocketPlus

Spb PocketPlus is officially a Today screen plug-in, but it offers many functions in one package. Highlights include tab support, battery/memory indicators, and drag-and-drop quick-launch application buttons on the Today screen. There's also Zip support, and you can format memory expansion cards in File Explorer. Enhancements to Pocket Internet Explorer let you have multiple windows, save Web pages, view page source information, and view Web pages in full-screen mode. More general improvements include a truly functional Close button, a battery indicator, and support for extended themes. (\$14.95)

www.spbsoftwarehouse.com/products/pocketplus/?en

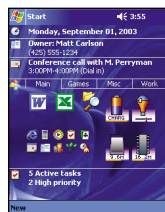
Speereo Voice Organizer

Speereo Voice Organizer uses voice recognition to let you set and check appointments, meetings, and tasks. You can also find contacts, search your schedule, and record voice notes to add to tasks or contacts. If you're tired of struggling with your handheld's sometimes-fussy character-recognition system, Speereo Voice Organizer is an alternative. It also synchronizes fully with Outlook. (\$39.95)

www.speereo.com/Products/vorgan.html

Taplet Pocket Manager

This is another Today screen plug-in, but Taplet Pocket Manager takes a slightly different approach than Spb PocketPlus. With Taplet, you create your own Today screen with program shortcuts, device settings, documents, music files, and photos



Spb PocketPlus

for a completely personalized launch pad. You can place items anywhere, resize photos using the stylus, and rename application shortcuts. The app is a unique utility that adds a great deal of customization, fun, and functionality to Pocket PC handhelds. (\$17.99)

www.poccosoftware.com/taplet.html

TimeTracker MX

This versatile time- and expense-tracking program also includes a mileage-tracking component. You can track billable hours and expenses by client, project, or task. A Desktop app is included, and you can use Microsoft Access to create additional queries, reports, and views on the Desktop. The pro version lets you integrate with Microsoft Excel, Quicken, QuickBooks, and Microsoft Money, as well as more advanced reporting capabilities. (\$49.95)

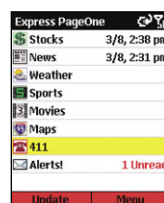
www.pocketgear.com/software_detail.asp?id=13993

Smartphone

Handmark Express

An easy way to get data from the Internet while on the go, Handmark Express includes channels for news, weather, sports, stocks, movies, maps, 411 information, and alerts. There are no ads or long waits due to uniform organizing, compressing, and downloading of only the relevant information. It works with Windows Smartphone 2002 or higher devices, plus Palm OS and Pocket PCs with wireless connections. (\$6.99 per month; \$69.90 per year)

express.handmark.com



Handmark Express

Handy Tools for Series 60

Handy Tools is eight utilities for Nokia Series 60 smartphones. It includes Handy Safe to manage passwords; Handy PhotoSafe for storing pictures; Handy File, a complete file-management utility; and Handy Book, an ebook reader with a full-screen mode. Handy Dates tracks birthdays and anniversaries, while Handy Expense tracks business and personal expenses. Handy Car tracks mileage,

maintenance, and fuel efficiency/consumption, and Handy Shopper tracks grocery lists. (\$12.50)

www.handango.com

PhatNotes

PhatNotes is a note-taking app for Windows Mobile Smartphones. It includes text-search capabilities, reminders, a spell checker, hyperlinks between notes, and integration with the built-in Contacts database. There's also an HTML export utility that supports custom templates and an email function that can send selected notes straight to a contact in your address book. You can organize notes by date, topic, or type, plus sync multiple PhatNotes databases to Microsoft Outlook. Palm OS and Pocket PC versions are also available. (\$29.95)

www.phatware.com

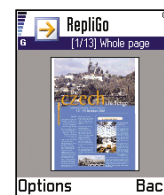


Handy Tools for Series 60

RepliGo

RepliGo is a document converter/viewing utility that lets you view Word, Excel, and PowerPoint files, plus PDFs, HTML Web pages, or any other document format you can print on your device. The converted file looks exactly like the original but takes up much less space. Features include zooming, searching for specific words inside a document, and reflowing text so it's easier to read. The viewer is free, while the Desktop file-conversion utility is \$29.95. RepliGo is available for Microsoft Smartphone, Nokia Series 60, Symbian UIQ, Palm OS, and Pocket PC.

www.repligo.com



RepliGo

Weather Companion

Weather Companion is a GPRS-based utility that provides up-to-the-minute weather data. Three views provide different levels of detail, and there's also five days of forecast information. Palm OS and Pocket PC versions are in development. (\$10)

www.pocketgear.com/ppcw/software_detail.asp?id=13926

The Bleeding Edge Of Software

Inside The World Of Betas

Mozilla Thunderbird 0.7.2

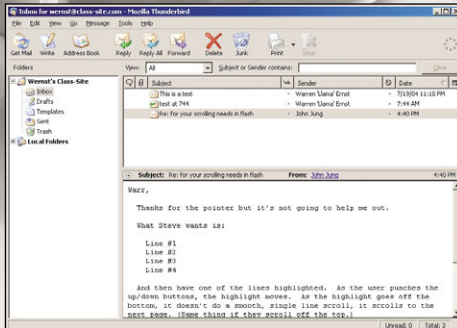
Mozilla's Firefox gets a lot of buzz these days, but Thunderbird may also see widespread popularity soon. The standalone email client comes from Mozilla's Internet suite and is good enough to use every day. The feature set may not wow you yet, though, unless you already use a Microsoft email program.

If you've used Mozilla or Netscape for your email tasks, Thunderbird will feel like a comfy pair of jeans. Mozilla has always had a competent, if somewhat conservative, email module that was one step ahead of Outlook Express but a couple steps behind The Bat!, Pegasus Mail, or PocoMail in terms of features. You can easily add more via Thunderbird's Extensions system, but there are only about 20 thus far.

The default layout puts mail folders in the left pane, an index of messages at the top, and

a preview of a selected message at the bottom. You can change this, plus track multiple accounts, send mail in HTML or plain text, and create filters to automate the handling of incoming messages. An adaptive junk mail filter based on Bayesian algorithms is on SPAM Patrol, and it works about as well as other filters based on this technology. The app can also import messages and address books from Outlook Express and others.

The beta worked flawlessly for me; I've stopped using Mozilla Mail for checking some accounts as a result. The one thing that keeps nagging at me, however, is that everyone I know who uses Thunderbird also uses Firefox, which means we all might as well be using the all-encompassing Mozilla and saving some drive space. Hopefully, additional features and speed will make Thunderbird stand out from its relatives. ▲



Official product name: Mozilla Thunderbird
Version # previewed: 0.7.2

Publisher: The Mozilla Organization
Developer and URL: The Mozilla Organization;
www.mozilla.org

ETA: Q4 2004

Why you should care: A comprehensive and free email client from a group worth trusting.

For more betas, subscribers can see
www.cpubetamag.com/cpubetamag04/betas.

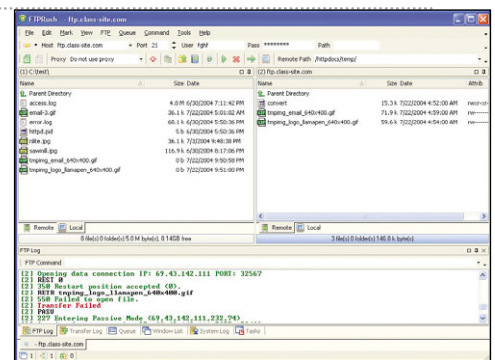
FTPRush 1.0.471 RC3 beta

You're thinking: Does the world really need another FTP client? Well, in an area where there are too many worthwhile programs chasing too few users, FTPRush shows a lot of potential for an up-and-comer.

The most obvious difference with FTPRush is its interface; it uses a tabbed UI that lets you jump among active FTP connections on different servers. This wouldn't be terribly useful unless the FTP program could directly transfer files from one FTP server to another, but FTPRush can, which is a big time-saver. Another big time-saver is the built-in, Pascal-like scripting language. Unfortunately, the beta does not have a help file.

FTPRush's feature list is strong, but some may not mean much if you don't FTP a lot. There's a Task Manager for scheduling uploads/downloads, FTP caching to speed up navigating through complex directory structures, and a file-renaming tool, which leaves one less reason to log in at the command line and remember the syntax of another Unix tool. There's also support for SSL and SSH logins, drag-and-drop support between FTPRush and Windows Explorer, a one-click server tester, and a Keep-Alive button.

FTPRush wasn't entirely stable; some files I queued for download never transferred, there were several crashes, and it didn't install correctly in Windows 98. But with time, it could be a contender. ▲



Official product name: FTPRush

Version # previewed: 1.0.471 RC3 Beta

Publisher: TianHong.NC China

Developer and URL: TianHong.NC China;
www.ftprush.com

ETA: Q3 2004

Why you should care: A feature-filled alternative in the FTP-client market.

Hearing is Believing

PC WORLD
WORLD
CLASS
2003

revolution 7.1

High-Definition Surround Sound for Your PC



Revolution 7.1

- PCI solution for high-definition surround up to 7.1
- 24-bit/192kHz output up to 8 channels
- Professional 24-bit/96kHz recording
- Real-time stereo-to-surround conversion
- Incredible 107dB SNR provides pristine audio

Sonica Theater

- USB solution for surround up to 7.1
- Up to 24-bit/96kHz audio output
- Professional 24-bit/96kHz recording
- Real-time stereo-to-surround conversion



TRUE
24 bit
192 kHz
High Definition

M-Audio's audio cards deliver immersive surround sound on your computer, rivaling that of the best movie theaters. Games, movies, and music—even your stereo CDs and MP3s—all sound more alive and intense with M-Audio surround solutions. Now you can enjoy amazing new cutting-edge audio standards like 7.1 surround sound and high-definition 24-bit/192kHz fidelity. Support for popular surround formats including Dolby Digital and DTS, as well as gaming standards like Sensaura, EAX, DirectSound and A3D, insures that you'll hear everything exactly the way it was intended.

Only one name is found in more studios and is used by more music professionals than any other: M-Audio. Now we've distilled all that experience into the most powerful, high-fidelity PC surround sound solutions available. In fact, PC World recently gave the Revolution 7.1 its highest accolade—the coveted World Class Award 2003.

Get M-Audio. Get M-Powered.

available at
COMPUSA
WHERE AMERICA BUYS TECHNOLOGY.™

M-AUDIO
www.m-audio.com

SPEED

UP TO

Upgrades That'll Keep You Humming Along

Updates for alternative email and media player apps, Microsoft's Office 2003, Nero, and the iPod are on tap this month.

Upgrades

Ashampoo Media Player+ 2.01

This versatile media-player runs audio and video. It gets a 10-band equalizer and integrated Internet radio support in this version, plus support for the FLAC lossless audio format, new visualizations, a better MP3 playback engine, and CD burning.

Get it at: www.ashampoo.com

Dell Digital Music Player 1.00.19

This update improves recording and digital rights management handling and lets you paste subfolders into the library's main folder.

Get it at: www.dell.com

DVD Shrink 3.2

DVD Shrink now has better support for Nero and can replace the title screen with space-saving still images.

Get it at: www.dvdshrink.org

Flash MX 2004 7.2

This update addresses numerous bugs and usability problems, plus performance tweaks. There are major changes in the placement and contents of the Configuration folders, and the help system and online documentation have been enhanced with hundreds of new examples for code and entries.

Get it at: www.macromedia.com

fooBar2000 0.8.3

The audio player gets bug fixes in this update related to MPEG-2 decoding, plus improvements in the file-renaming feature.

Get it at: www.fooBar2000.com

ICQ 4.1

One of the most popular instant messaging clients improves its message-window

loading time and fixes a bug in the contact list. ICQ now instantly saves text- and color-setting changes. Recent 4.1 versions have been released in more than half a dozen non-English languages.

Get it at: www.icq.com

iPod Updater 2004-07-15

The new software, available as separate downloads for various models, improves playback, song navigation, audio book reading speed, and playlist creation on click wheel models and adds compatibility with iTunes 4.5 or later for the mini and for iPods with a dock connector.

Get it at: www.apple.com

Microsoft Office 2003 SP1

The first Service Pack for Office bundles previous Office fixes and patches, plus individual updates to Excel 2003 and Word 2003. SP1 offers substantial security and performance improvements and numerous fixes across all of the individual programs. Each of the suite's programs is updated in this main SP1 package, but a separate SP1 download is required for Visio 2003 users.

Get it at: www.microsoft.com

Nero 6.3.1.17

The venerable disc burner gets an incremental upgrade with fixes for compatibility with Windows XP SP2, erasing rewriteable media, adding AVI files to VCDs, multisession DVD-R discs, and many more across the range of Nero functions.

Get it at: www.ahead.de/us

PHP 5.0.0

This ubiquitous scripting language for Web-page development produces scripts that can be embedded in HTML code. The

new version fixes a host of bugs and buggy behavior with some commands.

Get it at: www.php.net

Skype 1.0.0.10

This popular software uses P2P networking to power Internet telephony among users with headsets or USB phones. Recent builds culminating in this version have fixed a crash problem with Windows 98/Me and added file-transfer capabilities, new alert sounds, emoticons, and many enhancements.

Get it at: www.skype.com

Talisman Desktop 2.8 Beta

This replacement for the Windows Desktop lets users fully customize the look and feel of the main screen, including embedding HTML pages and Flash movies. The new version fixes several bugs.

Get it at: www.lighttek.com

The Bat 2.12

The powerful email client boasts "significantly improved IMAP and Exchange functionality." The update also enhances folder compression and defragmentation on NTFS drive volumes.

Get it at: www.rittlabs.com

ZoneAlarm Pro 5.1.009 Beta

The venerable firewall gets fixes for problems with the AOL browser, Visual Studio hangs with IIS Server, and IIS FTP problems. You can also now register with Microsoft Baseline Security Analyzer with the firewall up.

Get it at: www.zonelabs.com

Driver Bay

NVIDIA nForce Unified Driver 4.27

For nForce motherboards (except dual-processor models), these new drivers have compatibility fixes and add support for Serial ATA controllers. The new NVMMixer replaces SoundStorm for audio mixing. Also new is a Speaker Wizard for accurate speaker settings, Cinesurround for virtual 5.1 sound in headphones, WMV-HD support, and many other audio enhancements.

Get it at: www.nvidia.com

by Steve Smith

Who Has Your Back?

A Roundup Of Five Backup Applications

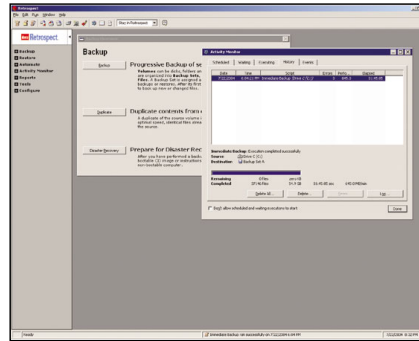
Imagine being the person responsible for figuring out how much deceleration a human body can stand in the event of an airplane crash. As it turns out, Dr. John Paul Stapp voluntarily did just that during a series of tests run at Edwards Air Force Base in the early 1950s. He withstood nearly 45Gs of deceleration force without any adverse effects.

Capt. Edward A. Murphy was an engineer working on the same project, MX981. According to Air Force records, Murphy discovered a transducer that had been incorrectly wired and cursed the guilty technician saying, "If there is any way to do it wrong, he'll find it." And so Murphy's Law was born.

Murphy's Law rears its ugly head during the most inopportune times, such as the day before a term paper is due when your computer's hard drive experiences a failure before you can backup your critical data. Whatever can go wrong will go wrong.

There's no reason your valuable data should fall victim to the law of Murphy's faulty transducer, though. Quick and easy backup solutions abound. Further, media is plentiful and inexpensive. But what about dependable software? Beyond the popular applications for copying and burning optical media, consider a more comprehensive backup routine for protecting your most precious data. As Bryant Kittelson of Host Interface International advises, you might even want to take your saved information offsite to safeguard against theft and fire.

To that end, we have gathered five backup applications for review. Our test bed included an AMD Athlon 64 FX-51, ASUS SK8V K8T800 motherboard, 1GB of Corsair DDR400 registered memory, a Plextor PX-712SA SATA DVD±R/RW drive, a Seagate 146GB 10,000rpm SCSI drive, an Adaptec 29160N Ultra 160 controller, and a Seagate 160GB external USB 2.0 drive.



Retrospect Professional 6.5

\$129

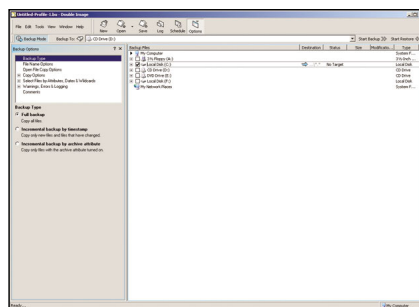
Dantz

www.dantz.com



Dantz Retrospect Professional 6.5

Despite its high-end price, Retrospect Professional is actually the most affordable member in a family of backup applications designed for heavy-duty enterprise use. Retrospect's touted capability is the progressive backup, which only copies new files or those that have changed, eliminating the need to choose between the full or incremental modes that competing apps



Double Image-O 5.0

\$199

Host Interface International

www.hostinterface.com



offer. The result is almost arduous at first. (It took almost two hours to save 57GB.) Retrospect copies data into a slew of 600MB packages, comparing its backup set to the source data. However, after using the same system for more than a day, manipulating 1.1GB of data in the process, the progressive backup took just three minutes copying to the 160GB Seagate external USB 2.0 hard drive.

The app's backup menu also includes options for duplicating entire volumes and creating a bootable CD for disaster recovery. An intuitive wizard that lets you manually choose the desired source, destination, and security settings drives each task. Options are all preserved so that the next progressive backup will already be configured. Alternatively, you can automate the whole process using an EasyScript Wizard, which schedules the frequency of backups and the quantity created in case you want multiple copies.

Although the Professional version isn't intended for small- or medium-business environments, it does include two network licenses that allow a host to back up data from clients on a LAN. Supported backup devices include tape drives, hard drives, NAS devices, and optical storage. Although the retail build of Retrospect didn't support the Plextor PX-712SA in my test bed, a recent driver update remedied the issue.

Retrospect version 6.5 runs on Windows 98/NT 4.0/2000/Me/XP. However, it is capable of backing up networked clients running Mac OS 7.1 and later, as well. All other versions of Retrospect, except the Professional version, add Linux backup capabilities.

Host Interface International Double Image-O 5.0

Most high-profile backup applications use proprietary file formats for saving either one large drive image or a series of

compressed packages. The primary strength of Double Image-O is its universality. After copying a 57GB partition in just over 67 minutes, all of the data on the target looks just as it did on the source. In comparison, Dantz Retrospect, Norton Ghost, and Drive Image 7 all use packaging systems that aren't readily accessible by

Windows Explorer. The downside is that by default, Double Image-O doesn't use any sort of compression and takes awhile to execute a complete backup. Incremental backups are much quicker, fortunately.

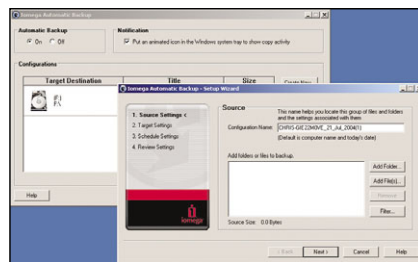
Double Image-O is unique in its ability to back up and restore Linux and Novell clients connected over a network. It isn't limited by client licenses either, as Double Image-O can back up multiple clients across local and remote networks. According to Bryant Kittelson at Host Interface, Mac support is also on the way. Support for open-file backup is another instrumental feature, as is scheduling.

Although Host Interface claims that Double Image-O works with any device recognized by Windows, it wouldn't write to a blank DVD+R. Moreover, the utility is intended strictly for backup duties, and it doesn't come with any options for disaster recovery. Instead, Kittelson recommends creating a hot standby drive, a regularly updated spare disk to literally replace its source should a failure occur. Keep in mind that the process is somewhat involved, though.

Double Image-O runs on WinNT/2000/XP. It also supports Windows Server NT/2000/2003.

Iomega Automatic Backup

Although most of Iomega's experience is on the hardware side of storage, its Automatic Backup utility makes quick work of real-time backup. It isn't the heavy-duty cloning package you would expect from Dantz or Symantec, primarily because it does not use compression.



Iomega Automatic Backup

\$39.95

Iomega

www.iomega.com



Rather, Iomega's solution monitors your work and automatically saves a backup every time the source changes.

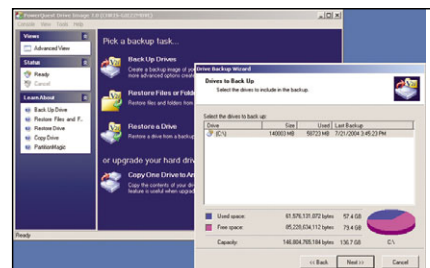
One of Automatic Backup's coolest features is that it lets you specify a number of revisions to save. So, a particular document might exist in five different states of completion on your backup drive. You can also disable the feature altogether and rely on Iomega's integrated scheduler to check selected file types every few minutes for changes or on selected days at a certain time.

Automatic Backup is designed to work with Iomega's own hardware. The app is included free with Iomega DVD, Zip, NAS, and hard drive kits. Nevertheless, it works with other manufacturers' products, as well. A complete backup of my 57GB partition took roughly 110 minutes on a Seagate 160GB external USB 2.0 drive. My Plextor DVD writer, unfortunately, wasn't recognized with DVD+R or DVD+RW media, though optical backup doesn't make much sense for real-time storage anyway. If your target repository is unavailable for some reason, Automatic Backup even includes a provision for temporary storage on your local hard drive until the target is detected again.

Automatic Backup runs on Win98/98 SE/2000/Me/XP and Mac OS 8.6 and higher, including OS X.

Symantec Drive Image 7

Perhaps you are wondering why Symantec sells two products that perform nearly the same function. Indeed, Ghost 2003 and Drive Image 7 are similar—with the major exception that Drive



Symantec Drive Image 7

\$69.95

Symantec

www.symantec.com



Some of IBackup's extra features include email access into your storage account and iDrive and mapped access to your storage account that appears as a local drive in Windows Explorer. And you thought we were talking about BMW's control center, didn't you? ▲

Back It Up, Buddy; It's Time To Compare Apps

Here's a look at the good, bad, and ugly concerning the five backup applications we tested for this roundup.

	Dantz Retrospect Professional 6.5	Host Interface Double Image-O 5.0	Imagem Automatic Backup	Symantec Drive Image 7	Symantec Norton Ghost 2003
Price	\$129	\$199	\$39.95	\$69.95	\$69.95
Pros	Very thorough software; regular driver updates; two network licenses included; integrated scheduler; progressive backups	Nonproprietary backup procedure makes it easy to access files; backs up to network locations; supports open file backup and RAID arrays	Simple to use; can save multiple versions of each file; inexpensive (free with most Imagem hardware); Mac version available	Works from within Windows; uses compression for reduced transfer time; broad device support; integrated scheduler	Simple application for home users without fancy disk configurations; less expensive than many alternatives
Cons	Extra client licenses, proactive backup, advanced tape drive support, and Microsoft Exchange Server support all require purchase of add-on licenses	No native disaster recovery support; most expensive app here; somewhat less intuitive UI	Limited device support outside of Imagem's product line; no compression means full backups take a long time	Doesn't support incremental backups; feature set is limited relative to competition	DOS mode spells trouble for modern device support; relatively limited feature set
CPU	    	  	   	  	 

Image works from within Windows rather than rebooting to DOS.

Symantec acquired the rights to Drive Image when it bought PowerQuest. The Drive Image 7 package actually includes two apps. The first, Drive Image 7, runs under Win2000/XP, enabling support for copying to DVD writers, external USB/FireWire devices, and network drives. It's also the only version capable of performing its duties without leaving Windows. Drive Image 2002 supports Windows 95/98/NT/Me, but it's limited to creating disk-to-disk images and saving to CDs.

It's little wonder Symantec purchased PowerQuest. Drive Image 7 works out of the box without tweaking any settings or optimizing any drivers. It recognized my Seagate external hard drive and successfully backed up a 57.2GB partition on a SCSI hard drive in less than 50 minutes, compressing the partition into less than 49GB. Writing to the Plextor PX-712SA took about four times longer and 11 DVDs.

Like many apps that save to a proprietary file format, Drive Image 7 includes a browser to explore an image or selectively restore individual files. There's also an option to clone one drive over to another, making it easy to duplicate a software environment for similar hardware. An integrated scheduler automates the backup process

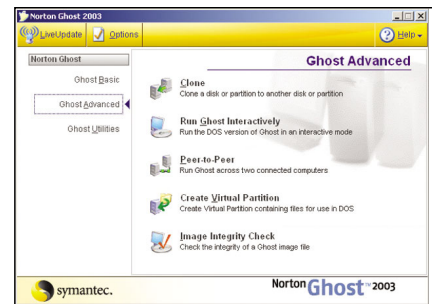
for late-night saves to a remote server. How's that for data security?

Symantec Norton Ghost 2003

Ghost was once the premier solution for overworked and underpaid tech writers responsible for benchmarking new hardware hours before deadline. And while it's still in vogue, there are a number of more attractive apps available, including PowerQuest's Drive Image 7, also owned by Symantec. Not that Ghost is poor software, but the actual backup process runs through DOS mode and requires a separate set of SCSI, USB, and IDE drivers to function.

Ghost's front-end is familiar to anyone using Norton AntiVirus. Symantec provides direct access to its LiveUpdate utility, keeping all Symantec software up-to-date. Of course, there's many customizing options for Ghost. Two menus enable different complexity levels. Basic allows wizard-driven backup and restore functions, while Advanced can clone disks, run Ghost across connected computers, and check an image file's integrity. A third menu has utilities for creating boot disks and browsing Symantec's proprietary image file format.

Unfortunately, Ghost didn't cooperate with my Plextor PX-712SA; it launched in DOS mode and immediately crashed, claiming the DVD writer was inaccessible.



Norton Ghost 2003

\$69.95

Symantec

www.symantec.com

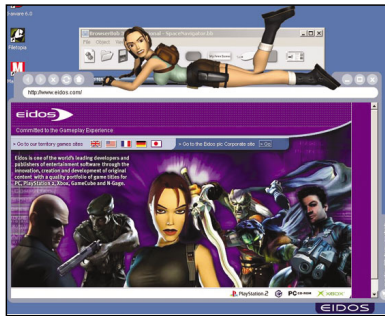


It also had problems with Seagate's 160GB SATA external drive, crashing in DOS mode again without finding the hard drive. Both issues are well-documented on Symantec's support site. Rather than fighting to get Ghost running under DOS, look instead for a more modern application that runs in Windows.

Norton Ghost 2003 runs under Win98/2000/Me/XP. It supports FAT/FAT32, NTFS, and Linux Ext2/3 file systems for backup, restore, and cloning tasks. ▲

by Chris Angelini

BrowserBob 3 Professional



BrowserBob 3 Professional

\$336

BrowserBob

www.browserbob.com



BrowserBob is a program that creates visual-based applications that let users use a familiar browser UI to access data. Examples of applications (dubbed “weblications”) include customized browsers (such as a Lara Croft-themed browser Eidos Interactive created using BrowserBob; download it here www.browserbob.com/download_examples.html), electronic books, sales brochures, or presentations you can store on CD or distribute as a single executable file over the Internet.

The first step to using BrowserBob is collecting the graphic elements that you want to include in your presentation, such as a company logo, and standard buttons, such as Home, Refresh, Forward, and Back. BrowserBob comes with a handful of graphics to get you started, but the selection is limited. You’ll probably want to create your own using a program such as Photoshop.

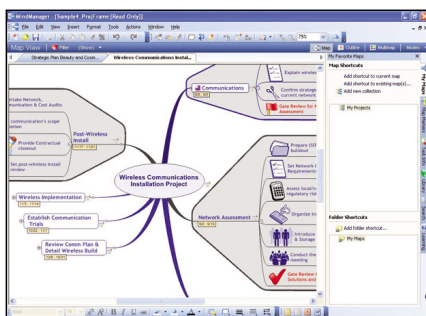
Once you collect your graphics, you can paste them into your browser window, which can be rectangular or the shape of a graphical image, such as a

car or a television set. For more pizzazz, the browser can change shapes while in use. You can also add drop-down menus and create an address bar that users can type a URL into. In addition, you can add anything you might normally display on a Web page, including HTML code, WAV files, graphics, Flash movies, and even ActiveX controls. Toss in some Web pages to embed in your browser, and you can create an interactive presentation anyone can view using your custom browser.

By creating these online presentations, brochures, or electronic books with BrowserBob, you’re essentially creating an application that’s visually interesting and easy for anyone to use. Better yet, BrowserBob lets you distribute your creations royalty-free as a single executable file.

You may find BrowserBob is more daunting to learn than PowerPoint, but ultimately it will reward you with a more flexible and powerful tool for creating presentations. There are also Freeware and Light (\$59) versions of the program, which work with Windows 98/Me/2000/XP. ▲

Mindjet MindManager X5 Pro



MindManager X5 Pro

\$299

Mindjet

www.mindjet.com



MindManager is definitely a niche product, but that niche can include people from all sorts of backgrounds. Basically, the program lets you create mind maps, which is a method of organizing your ideas visually.

A mind map lets you jot down ideas or topics anywhere on a page and then draw lines connecting related ideas, thus creating a spiderweb of associated thoughts. Mind maps are easy to create, and their visual nature means they’re easier to read at a glance than traditional outlines based solely on text.

If you have a Tablet PC, you can draw mind maps directly in MindManager. Non-Tablet PC users can draw mind maps using a keyboard. Pressing the Insert key draws a new box to type text in. Using the mouse, you can drag the box near another topic so the program automatically draws a line connecting the two.

You could create mind maps to just organize your thoughts, but the program works best with

popular Microsoft programs. If you need to write a report, just create a mind map to capture your ideas and the program turns the mind map into a traditional outline you can export, edit, and expand upon in Word. If you’re creating a slideshow presentation, jot down the topics you want to discuss as a mind map and export the mind map to PowerPoint. If you’re working on a large project, create a mind map that shows all the tasks you need so everybody understands the project goals. You can then export each task into Outlook to assign specific tasks to individuals.

If learning a new program or learning a new process for organizing your ideas doesn’t appeal to you, you won’t like MindManager. But if you’re curious about creating mind maps as a thinking tool, MindManager can become one of the most useful programs you’re likely to find. The program works with Windows NT/2000/XP (a 2002 version works with Win98/98 SE/Me) and also comes in a consumer (\$199) version. ▲

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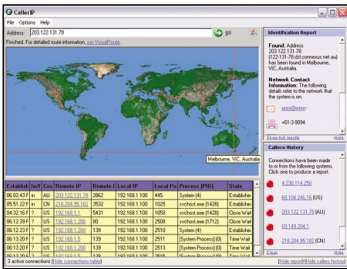


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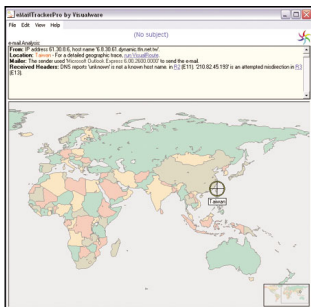


CallerIP 1.1

\$29.95

Visualware

www.visualware.com

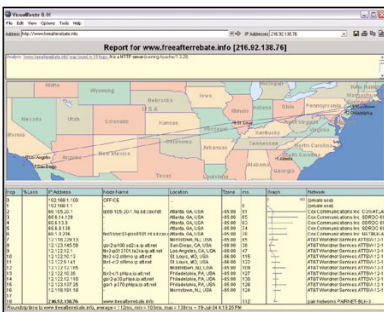


eMailTrackerPro 3.0a

\$29.95

Visualware

www.visualware.com



VisualRoute Personal Edition 8.0f

\$49.95

Visualware

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Visualware CallerIP 1.1

The average Internet-connected PC can have dozens of background connections every hour without the user's knowledge. CallerIP can help decipher what is connecting. The app monitors TCP/IP connections and presents charts of its activity. When an incoming/outgoing connection is made, CallerIP shows information about that connection. You see the remote IP address and port number and, if you're running Windows XP, the app that made or accepted the connection.

I disabled my firewall, and within minutes CallerIP showed scores of attempted connections from port-scanning scripts, worms, and more. The number of unauthorized attempts is amazing (and

discouraging). Clicking an IP address shows contact info, including an email address, phone number, and mailing address for that network and domain. The selected network location is also highlighted on a world map. This is equivalent to (but easier than) using Dig and Whois.

You can't see the content of the traffic, just the source/destination, so CallerIP doesn't provide as much data as a full-fledged packet sniffer. It also doesn't block connections. During testing, a dialog box warned me a possible backdoor connection was made. It was just my Mac's file-sharing client.

Caller IP is much easier to use than a packet sniffer and more informative than some firewalls. ▲

Visualware eMailTrackerPro 3.0a

eMailTrackerPro is another app in Visualware's arsenal of detective tools. It aims to determine the source of spam, viruses, and other email messages. When you feed the program a message's headers, it attempts to verify the host that originated the message and show the message's origin on a world map. If the sender is disguised, the app identifies the misdirection scheme used to obscure it.

If you use Microsoft Outlook, eMailTrackerPro adds a tracker button to the toolbar for one-click activation. For any other mail client, you must copy message headers to the clipboard and then paste them into eMailTrackerPro for analysis.

The program doesn't do much more than any moderately knowledgeable user could do by reading the message headers and using Dig to look up IP addresses. Although it can verify if a message's source is legitimate or forged, its helpfulness ends there. There are no tools for reporting, bouncing, or otherwise dealing with a message if it's spam. It can also be too vague when reporting a message's origin, showing only "The Americas." (A Whois search might show the address, city, and phone number of the sender's ISP.)

eMailTrackerPro is a one-trick pony, and the trick simply isn't that useful. ▲

Visualware VisualRoute Personal Edition 8.0f

VisualRoute combines traceroute, ping, and Whois functions into a graphical interface. When you type a URL or IP address into the program's Address bar, it builds a traceroute table, showing a packet's path from your PC to the destination server. A graph shows the minimum, average, and maximum times ping packets took to reach each host along the way, which can help identify network bottlenecks. Best of all, a large world map shows the route those packets take.

Clicking a network or node name in the traceroute table reveals info from Whois about that network. You can export the traceroute data and map

as HTML, JPG, or text. The program also includes a ping utility that graphs the roundtrip response time for each packet. When you type an email address into the email tracker function, the program lists and then verifies that host's mail servers.

The interface can be inconsistent; some windows look like they belong on X rather than Windows. Aside from the map, the program doesn't provide any more information than text-based traceroute tools, but it's significantly easier to use, more configurable, and prettier. I'm just not sure it's worth \$49.95 unless you spend a lot of time troubleshooting network problems. ▲

How To Overclock Outlook

I love Microsoft Outlook 2000, and I loathe Microsoft Outlook 2003. I've been using OL2K for years, and I can honestly say that there's no better PIM on the market today. It's always been fast, efficient for everyday use, and powerful enough to support a wide variety of third-party plug-ins without the user experiencing an impact on overall application performance. Guess what I'm gonna share with you this month?

PocketKnife Peek (free; www.xintercept.com). With this on-demand add-in, you can preview any message without opening it. There's no easier way to recognize URL spoofs. It'll automatically trans-mogrify HTML messages into text, letting you break the chain and respond in ASCII with ease.

SpamBayes (open source; spambayes.sourceforge.net). This project picks up where Bayesian filtering left off. I haven't found a better-integrated spam stomper for my Inbox. It's simple to train, use, and maintain over a lengthy period of time. There are no whitelisting features within the client, but I've found false positives to be inconceivably low. (See page 53 for more.)

OutlookHelper (free; www.outlookhelper.com). Create voicemail, animated messages, view attached images from several messages *en masse*, and much more. It also comes with a virus alerter—something your co-workers probably need more than you.

Lookout (free; www.lookoutsoft.com). Recently acquired by Microsoft, this relatively new tool hit the ground running a few months ago. In the background it indexes the messages in your Outlook and Windows folder hierarchy. What makes it good? Speed. Pure, unadulterated speed.

NewsGator (\$29; www.newsgator.com). RSS and Atom are here to stay, so you might as well find a news aggregator that already matches your lifestyle. It's still a little rough around the edges, but then again, I subscribe to well over 1,000 feeds. It's easy to forward your favorite posts to friends and colleagues, and sometimes (if the entry is properly configured) you can follow up with the author immediately. Seamless.

PayPal Payment Wizard (free; www.paypal.com). I can't think of anybody who doesn't have a PayPal account. I've been with them since they were X.com. Remember those days? Instead of logging into the

Web site to set up a payment URL or button, you can do it all within Outlook. Lockergnome.com, my own company, uses PayPal for our Payment Processing, so this has truly been a godsend for our invoicing department . . . , I mean, person.

Attachment Options (free; www.slovaktech.com). There is no easy way to work around Outlook's all-or-nothing attachment-blocking approach without outside help (or Registry hacking). Through this tab you can enable and disable file types at will. I guess you never know when someone's going to send you an OPS (Office Profile Setting). It could happen.

UrlRunAddIn (free; www.cheztabor.com).

Broken URLs, be gone. If someone sends you a link that has more than a billion characters, chances are you got it in a broken state. Instead of sewing that sucker back together with a complicated

copy-paste routine, just install this and right-click on the mess (including any brokets).

Send to OneNote from Outlook PowerToy (free; www.shahine.com/omar). Tablet PC users will love this little sucker. I'd tell you more about it, but its title is pretty darn descriptive. End of line.

Personal Folders Backup (free; www.microsoft.com). When was the last time you saved a copy of your PST to another hard drive? What are you waiting for, an irreversible crash? Let this remind you to do the deed once a week.

Infuzer 5-day Weather Feed (free; www.infuzer.com). This very extension is what inspired me to assemble this article. Keep it running in your System Tray and it'll keep your Outlook calendar filled with the latest weather forecast for your area. Amazing and absolutely indispensable, especially if you're also a Pocket PC user.

Outlook Reminders by Email (\$7.50; pwp.netcabo.pt/rsoutlook). As the name implies, there's no better way to keep your calendar synced with your mail account when you're out and about. There's also a Send By SMS add-in available here if you're never without your cell phone.

That just about does it for now. I'd love to share more, but the editors cane me if I spill over into Pete's section. ■

You can dialogue with Chris at chris@cpumag.com.

What makes it good? Speed. Pure, unadulterated speed.

Chris Pirillo has been writing online in a professional sense since 1996 through his own site, Lockergnome.com. In recent months his personal blog (chris.pirillo.com) has achieved record-breaking indexing. Chris is ranked #1 on Blogrolling.com, #76 on Daypop, #15 on Feedster, #40 on Popdex, #84 on Technorati, and #39 on Bloglines. If those names sound like utter nonsense to you, then perhaps you need to stay in more—and start using the services at Lockergnome.net.





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HYPERSONIC

Reflections On Extensions

For complicated programs, everything should be as simple as (but no simpler than) necessary.

There's something incredibly satisfying about learning to use *nix OSes from the command line, and it's only partly the satisfaction of learning anything new and possibly tricky. The real payoff comes from discovering the underlying simplicity and understanding how it produces such elegant complexity.

Consider `ls`, the command for viewing the contents of a file system. Executed without parameters, it outputs a simple list of file names. For more information about each directory entry, add parameters: `-l` for detailed ("long") listing with file attributes; `-a` for "all," including hidden files; `-s` for file size; and `-h` for "human-readable" (kilo-, mega-, and giga- units). Adding the `-R` parameter lists directories recursively. `-B` ignores backup files. And so on. But `ls` always dumps its output directly to the screen without pausing unless I pipe its output elsewhere.

One reason *nix shines is that each program does one thing. `ls` lists directories. By using parameters you can add new features to the program without breaking any old ones. Another display of *nix brilliance is that you can create quite complicated, yet elegant, applications with pipes. Piping is a virtual construct allowing shell commands to accept input from the keyboard, a file, or another program's output and direct that output to a screen, file, or another program.

Thus, to view directory listings one screen at a time, pipe the output from `ls` to `less`, a pager program. It displays one screenful of data at a time (and much more). Consider this command, for example:

```
ls / -lashR | less
```

It lists every directory item in the system and lets you browse with `less`. But if I'm looking for specific files, say, those with names five characters long, beginning with the letter "a," and ending with four digits, I can use `grep`, which uses regexp (regular expressions) for pattern matching.

Recently, I fubarred my system by changing a configuration file (I know not what; it was done automatically by a GUI app), and I lost the ability

to run an X session. Using only the command line, I had to figure out what had changed and change it back. I knew when the change occurred (about 9:20), and I knew it was a file owned by userID `pete`. I found it by entering this command:

```
ls / -lashR | grep "2004-07-23 09:2" | grep pete > changed.txt
```

That's the quick-and-dirty approach of a novice; masters of regular expressions could produce far more elegant solutions. But mine worked.

Which brings me to the jewel in the *nix crown. As I played with a group of must-have utilities, I found it's rare that a *nix program can't be modified, extended, or expanded, even the graphical ones. Many GUI apps are little more than human interfaces for executing shell commands. You can customize button locations in the Gentoo file manager, but you can also specify the shell commands to execute.

That kind of control over function may be beyond the needs of most casual users, but anyone who's wrestled with

programs that don't do exactly what they want them to will welcome the freedom that *nix applications offer. Even more than that, you can customize your GUI front-end file manager or FTP client or Web browser all you like and still be able to transparently patch, upgrade, or even replace the underlying *nix programs.

*nix OSes almost entirely comprise such simple little commands that you can pipe together into sophisticated tools. That approach flows through even to the GUIest of graphical applications on the shiniest chromed desktop environment. When there's a firm foundation of sturdy little bricks, you can pull an old one out and replace it without the whole building tumbling down.

For everyone who responded to my column (August *CPU*, page 78) about the comparative costs of commercial and open-source must-have software, thank you. As of midsummer I am still getting responses. You folks all have some excellent points to make, and I'll respond to them next month. See you then. ■

Get saucy with Pete at pete@cpumag.com.

**I found it's rare
that a *nix program
can't be modified,
extended, or
expanded, even the
graphical ones.**



Pete Loshin, former technical editor of software reviews for Byte Magazine (print version), consults and writes about computing and the Internet. He also runs <http://www.linuxcookbook.com>. He owns shares of both Microsoft and Red Hat and believes that Windows isn't for everyone, but neither is Linux.

The Rise Of The Blog

The Art & Business Of Blogging

blog online. (See the “From Browser To Blogger In 10 Minutes” sidebar.)

For the uninitiated, Web logs, or blogs, are Web pages with dated entries often containing links to other material on the Web along with comments by the author or readers, and they have been with us since the day the World Wide

mode of self-expression and virtual community building.

At least 4.12 million blogs existed by mid-2003, says research firm Perseus in the last major survey of the platform, and it projected there would be 10 million

If you are not blogging yet, then you may be missing one of the signature trends for this generation. Weatherman and famed weight-loser, Al Roker blogs at AlRoker.com. Even long-forgotten celebrities such as Lisa Whelchel from “Facts of Life” has a blog (www.lisawhelchel.com/coffee.html), as do Gillian “Scully” Anderson (www.gilliananderson.ws/messages) and Wil “Wesley Crusher” Wheaton (www.wilwheaton.net). In fact, in the time it takes you to read this article, you, too, could have a

Web was invented (see the “Blog History” sidebar). Early blogs such as Slashdot.org tended to be very tech-oriented, and many blogs still focus on any number of topics, particularly tech and politics. Blog search engine Technorati.com says it indexes 3.4 million such sites. In recent years, however, the form has broken out to become also a kind of public journal writing as literally millions of teens and twentysomethings have embraced the blog as a

Blog History

According to Blog historian and pioneer of the form Dave Winer, the first Web site ever posted to the Web in 1992 (info.cern.ch, archived at www.w3.org/History/19921103-hypertext/hypertext/WWW/News/9201.html) for the CERN European Organization of Nuclear Research (public.web.cern.ch/public) was actually a blog because it pointed to all of the new sites that were emerging daily on the Web. It was run by Tim

Berners-Lee, one of the co-inventors of the Web. Among the early and famous blogs in the mid-’90s were Robot Wisdom (by Jorn Barger), Scripting News (by Dave Winer), and CamWorld (by Cameron Barrett). According to lore, the term Weblog was coined by Barger in 1997. Tech Mecca Slashdot.org also came along in 1997, co-founded by CPU’s own columnist Rob Malda.

Because it required HTML coding skills and your own Web

host, blogging remained a fairly geeky pursuit until 1999 when Web-based blog tools emerged from Pitas (www.pitas.com) and Pyra Labs (www.blogger.com). The rise of user-friendly, hosted Weblogs made the industry explode after 2000. Although some analysts estimated only a few hundred thousand blogs as late as 2002, current estimates of industry acceleration project 10 million blogs by the end of 2004. ▲

The Truth Laid Bear
"A bear, the world, and the strong urge to hibernate"

VOLUME 1062 SOUTHERN CALIFORNIA, USA, AUGUST 05, 2004 07:22 PM FREE

GIVING NEW MEANING TO "HIT COUNTER"
August 03, 2004 07:20 PM

CNN: Al Qaeda suspect reveals Web strategy

Apparently, it involves picking fights online with high-traffic terrorist web sites, making-up online to high-traffic terrorist web sites, and e-mailing Clinton about.

Maybe not that last part.

Comments (4) | Trackback (0)

SENATOR TED: PEOPLE SUCK
July 28, 2004 06:27 AM

On a more serious note, I couldn't help but pause when I heard that nugget from Senator Ted last night.

BITE-SIZED TRUTH
06/26 05:20 PM:

Folks: I know some of you have had problems with the alliance blogroll code lately. Do somewhat rumpled as to what the problem is. That code hasn't changed in ages, and I haven't updated anything lately. And, on some sites at least, it seems to be working.

There is a possibility that the problem is due to the fact that the whole site was down due to a

The Truth Laid Bear site not only makes its own regular entries, but also it monitors activity at other major political blogs around the world.

blogs by the end of 2004. In addition to the proliferation of free and simple blog-making tools, the phenomenon has accelerated with the emergence of RSS (Real Simple Syndication). Many bloggers use these XML feeds to distribute the latest headlines from their blogs and also monitor new postings within their circle of like-minded bloggers.

And blogging is not just for self-expressive teens. Mighty Microsoft recently started Channel 9 (channel9.msdn.com), including remarkable video and text postings by five employees about software development. Everyone is blogging because, “Publishing is now as easy as ordering something off of Amazon,” says Jason Calacanis, CEO of Weblogs, which has a

network of 50 blogs that aggregate news on everything from consumer electronics to parenting. Blogging used to require HTML coding skills, but the latest tools from companies such as Blogger.com (a Google company) put powerful online design tools and templates for blogging in any user's hands, either for free or a small fee. "Now you can spend 90% of your time writing and 10% on tech. That's really what has driven this," says Calacanis. Blog-City (www.blog-city.com), DiaryLand (www.diaryland.com), LiveJournal.com, and Xanga.com have become some of the main suppliers

of easy blog tools and hosting space for neophytes, while more advanced users now have very sophisticated content management software specifically designed for blogging such as Movable Type (www.movabletype.org) or the open-source Slash (www.slashcode.com), which powers one of the oldest blogs, Slashdot.org.

A Culture Of Blogging

Blogging also got serious in this election year as waves of amateur online political pundits became a force in the grassroots support for Democratic hopeful Howard

Dean. Both parties gave a small handful of press credentials to bloggers who flocked to the national convention cities hoping to get in.

Although there are bloggers of all ages and across every category of interest, this clearly is a generational phenomenon, with 92.4% of blogs created by users under age 30, and 51.5% made by teens (Perseus). Although online journals seem like an almost self-absorbed act of self-expression, in fact blogging has become very communal. A culture of bloggers has emerged. Bloggers of similar mindsets tend to find each other and form rings of like-minded blogs that link to one another and include each other on their own blogrolls (obligatory lists of "other blogs"). RSS feeds allow a circle of readers and bloggers to keep watch over their community of fellow posters in real-time. "These tribes or clusters arise quite spontaneously," says Rebecca Blood, an early blogger and author of "The Weblog Handbook." "A quick look at their blogroll will tell you where they place themselves in the Weblog universe." Frequent posters such as Blood herself (www.rebeccablood.net) become blog celebrities.

Blood says that within tight rings of blogs, discussions often take place in public as call and response postings across the group's blogs. "Weblog culture could be characterized as conversational. . . . Bloggers link to and comment on one another's posts, and readers discuss entries among themselves," says Blood. Calacanis says, "The thing that's special about them is that they are a conversation."

Participatory Media

Blogging also has political implications because many argue that it is a reaction against our passive consumption of media. By choosing and commenting upon media snippets, users "recontextualize" the media streams and add their voice. And on the Web, everyone is equally accessible. The lowliest blog is one click away from NYTimes.com. As well, many blogs help elevate stories that otherwise would have been lost or unread in alternative media. Bloggers are also notorious fact checkers, who love to call big media on their missteps

Q&A

Jason Calacanis Of Weblogs:
Blogging For Bucks



Jason Calacanis, CEO of New York-based Weblogs, is trying to turn his network of 50 well-trafficked blogs (including Engadget.com and Autoblog.com) into a real business. He has 30 freelance bloggers writing his sites and is actually making money at it. The former editor of early Internet magazine CyberSurfer and publisher of trade publications *Silicon Alley Reporter* and *Venture Reporter* has learned a few things about squeezing revenues from Web trends.

CPU: How much can you make by selling ads on your blogs?

Calacanis: Every one of our blogs as of July has made money, and that is because we are getting advertisers who are buying

across all 50 blogs at once. Blogs can make anywhere from \$100 a month to some blogs doing \$8,000 to \$10,000 a month, but that's the exception. We figured if we could get each blog to \$500 a month, that would be pretty cool to be able to make \$6,000 a year.

CPU: How do you pay your bloggers?

Calacanis: Two different ways. We can pay them a flat fee—\$250 to \$1,000 a month—to blog for us, and in that case we own all of your words. We also have a deal where we split the revenues [from advertising], and you maintain a license for your words, so you can take your posts and write a book or magazine with them. The blogger gets the first \$1,000 a

month in ad revenues, and then we split it 50/50.

CPU: How does a collection of \$100-a-month blogs become a business, though?

Calacanis: If you look at what we are doing with Engadget or Autoblog, these are becoming more than just diaries. This is not somebody writing that I like this car. It's two or three people writing 15 to 20 times a day about what's going on in the industry. Autoblog is already the most updated news source in the car industry, and it is getting 5,000 to 10,000 people a day. Engadget is already having an impact getting 100,000 people a day. People are going to start to learn to trust certain brands, and they will become so trusted that they will spawn print magazines or TV shows or newspapers and the like. ▲

and errors of fact. "Their sarcasm and fearless commentary remind us to question the vested interests of our sources of information and the expertise of individual reporters as they file news stories about subjects they may not fully understand," says Blood.

"People don't trust traditional media," adds Calacanis. "It's owned by five or six gray-haired old guys." He thinks that the blogging trend represents the media markets correcting themselves, people demanding a more participatory kind of media, and being savvy media consumers who now aggregate and compare several sources of information before making up their minds. The adage "fact-check your ass" has become a war cry among some bloggers who hunt down errors in news stories. "It's a grassroots response to corrupt media," says Calacanis.

Blogging Business

Like all online platforms and trends before it, blogging has attracted investors with the prospect of finding ways for the platform to make money. In New York City, entrepreneurs Calacanis (Weblogs) and Nick Denton (publisher, Gawker Media), both veterans of various media projects, have started competing blog networks, which are trying to build blog brands and traffic that they can leverage for ad sales and even bigger media opportunities. Calacanis says that since launching in January, he has seen

From Browser To Blogger In 10 Minutes

In the time it takes you to read this article, even a neophyte can become part of the fraternity of bloggers. Once restricted to those who knew the arts of HTML and Web hosting, blogging is now as simple as filling out an online form. One of the most popular starting points is Blogger.com, a free, hosted blogger site started by Pyra Labs and eventually purchased by Google.

To get started, Blogger asks for a unique username, a password, and a Display Name, which will be the public name used to sign your blog entries. The registration procedure then asks

you to title your blog and to create your portion of a URL that will become the online address of your blog (for example, *yoururl.blogspot.com*). You also get the option of hosting your blog elsewhere and having Blogger point to it.

Blogger.com then presents you with about nine introductory templates, different designs for your beginner blog. The service then creates your blog and asks you to make your first entry. This is an online form that lets you title the entry and write it. There are options for typeface and letter sizes and a tool that lets you insert a Web

link. Once you are done with the new entry, just click the Publish button, and you have officially established a blog that you can update as frequently as you like and point friends and colleagues to for the latest news on you.

If you are ready for the next stage of blogging sophistication, try TypePad.com, a fee-based (starting at \$4.95 a month) hosted blogging service that gives you the tools and space for much more elaborate blogs. Other blogging services include LiveJournal.com, RadioUserland.com, and Xanga.com. ▲

50% to 1,000% revenue growth in some months. When Paramount Pictures released its remake of "The Manchurian Candidate" last summer, it is reported to have spent something around \$10,000 on banner ads at major political blogs such as Instapundit.com.

The RSS feeds that form one of the principal means by which bloggers

communicate with one another and their readers has also become a commercial focus as some advertisers look to buy space within these popular and highly targeted information feeds.

Some think that blogging can help businesses' bottom line in more subtle ways than ad sales. Both Microsoft and IBM were high profile attendees at the recent BlogOn 2004 conference in Berkeley, Calif. They are taking the long view, that employee and departmental blogs within corporations could improve communication among

Top 10 Blogs

With 3 million or so blogs in the blogosphere, who's to say which 10 are the best? These are the ones that keep us entertained and informed.

- | | | | | | | |
|--|--|---|---|---|---|---|
| <p>1</p> <p>Slashdot.org</p> <p>The father of all blogs was founded by <i>CPU</i>'s own columnist Rob Malda in September 1997, and it remains the epicenter of commentary and links on hardware, software, and cosmic thinking about technology.</p> | <p>2</p> <p>Gawker.com</p> <p>To track the silliness of celebrities and the craven media who follow them, nothing beats this exceptionally well-written and cheeky gossip log.</p> | <p>3</p> <p>Andrew Sullivan.com</p> <p>The former <i>New Republic</i> editor-in-chief may be the most literate and provocative instant pundit on the Web.</p> | <p>4</p> <p>Drew Curtis' Fark.com</p> <p>For weird and funny news, this is the blog of record, with tons of reader commentary on every outrageous link.</p> | <p>5</p> <p>BoingBoing.net</p> <p>This self-described "directory of wonderful things," is an offbeat compendium of pop culture, snarky political views, and cult entertainment.</p> | <p>6</p> <p>TalkingPoints Memo.com</p> <p>This blog comes from Joshua Micah Marshall, a Washington D.C. writer who links and snipes at some of the best political stories on the Web.</p> | <p>7</p> <p>MemePool.com</p> <p>This is the blog of everything, with scores of contributors adding frequent entries to art, tech, politics, food, humor, etc.</p> |
|--|--|---|---|---|---|---|

employees, across departments, and between companies and their customers. The Channel 9 project is designed to establish a real-time, personable connection between one of the world's most infamous monopolies and the development community that works with Microsoft products.

Blogged Down?

It remains to be seen whether blogging survives its own hype and actually becomes the grassroots power many bloggers idealize. Blood was among the blog throngs at the Democratic National Convention, and she complained that being "credentialed" seems to mean "permission to use convention Wi-Fi," as far as I can tell." And despite the parties bragging about inviting in the blog community, bloggers got no better access to candidates than regular attendees. "That's not reconfigured media," she says, "that's reconfigured public relations."

And of course, just because anyone online can publish to a billion-person audience doesn't necessarily mean that all of them should. After all of the blogging that went on related to the summer political conventions, columnists and some Web analysts complained that there was little unique insight to be found in the personal reports. "Lots of thoughts on how cool it was to be in Boston and how important blogging will be," sniped Jupiter Research analyst Michael Gartenberg (in his own blog [weblogs.jupiterresearch.com/analysts/gartenberg], of course).

And for all of the millions of blogs we keep hearing are out there, apparently most

Better Blogging

Even the best of blogs can get stale, lose readers, or never get found by like-minded readers. Here are some tips we gathered from experts in the blogger community for keeping your audience interested and helping them find you in the first place.

Headlines sell eyeballs. Write descriptive and inviting headlines for each entry because this is what brings people into your blathering. For those who are coding in HTML, include your descriptive headlines within heading tags. When search engine spiders hunt the Web for relevant content, they often index pages according to their HTML headings.

Archive your old posts. Again, having all of this content available increases your chances of a search engine indexing your site and lets you link to previous discussions.

Make and use good categories. Most blogging software lets you tag each entry according to your own predefined topics (news, politics, culture, etc.). This lets readers focus on the subjects that interest them in your archive.

Link like crazy. Link to the source story you are talking about, to other relevant stories, to other people's blogs. Not only is this good blog etiquette, but also it helps raise your visibility in search engines.

What's your frequency? The downfall of most blogs is sporadic posting. If you are really trying to cultivate an audience, you must act like a publisher and get fresh material up there.

Invite interaction. Once you have the posting thing down, start looking around for blog tools for plugging in user comments, polls, chats, etc. A good directory of blogging tools and accessories lives at BlogRoots.com.

authors don't have as much to say as they thought they did. According to Perseus, 66% of blogs haven't been updated in the past two months, and the average active blog only gets updated once every two weeks. In fact, about a quarter of these sites are one-day blogs that were abandoned after a day of posts. "Apparently the blog-hosting services have made it so easy to create a blog that many tire-kickers feel no commitment to continuing the blog they initiate," says Jeffrey Henning, CTO of Perseus and author of its blogging survey.

Indeed, technology has given us the tools and the distribution system to make any of us a publisher to millions. But do we have something to say? **CPU**

by Steve Smith

8 The Truth Laid Bear (www.truthlaidbear.com)

A witty news and politics blog distinguished by its massive directory of blog alliances, new blogs, and a monitor of which blogs in the blogosphere are most active.

9 A Day In The Life (www adayinthelife.org)

Contributors around the world chronicle their everyday lives in images and captions.

10 Channel 9 (channel9.msdn.com)

Now we know why Microsoft always misses its launch dates; its developers are making fascinating text, image, and video entries on this amazing blog that brings you into the belly of the Redmond beast.

Infinite Loop Shush?

Researchers at Spain's University Jaume I are developing a robot that its developers hope will pursue the peaceful occupation of librarian. The robot is equipped with three wheels, multiple digital cameras (for a greater field of vision), touch-sensitive sensors, and a mechanical arm with two digits. It uses voice-recognition software to process book requests from patrons. The robot accesses a library catalog database, navigates to the proper shelf, uses its cameras to read the book label, and retrieves the book for the patron.

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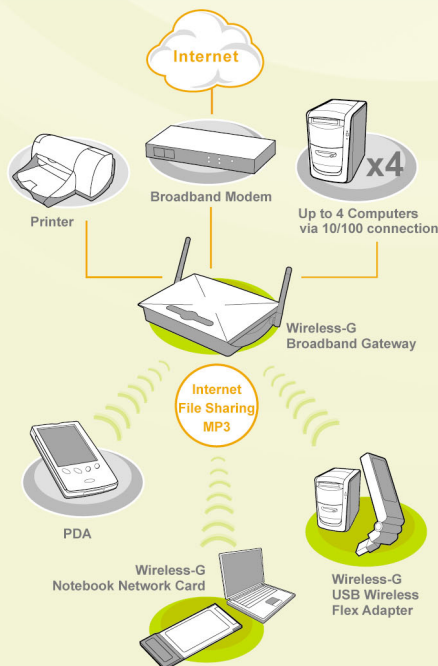
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Retire the Wire.

Coder's Corner: XML

XML Schema, Part 4, Creating Custom Simple Types

Last month (September *CPU*, page 84) we discussed simple and complex types and how types are core to the XML Schema model. We also explained complex types (basically types that allow elements inside) and how Schema authors use them. This month we'll talk about simple types, which despite the name are decidedly not simple. We'll review the history of simple types and detail how authors can design their own.

Simple Type Review

As noted previously, XML supports two classes of types: simple and complex. Essentially, simple types are constrained text strings without markup or attributes. Thus, strings (such as "hello there!") or real numbers (such as "1.23e+23") are examples of simple types. As a basis for Schema design, XML Schema predefines 44 simple types, which cover concepts such as numbers, dates, times, URLs, DTD- and XML-related types (such as ID and Name), and so on.

All simple types are derived from one base simple type. However, the theory behind simple type derivations and the approach for defining these core 44 types can be intimidatingly complex. Indeed, there is a specification document that's devoted solely to simple types. This document defines the model that's used to describe simple types, uses the model to define the 44 predefined types, and outlines the XML Schema mechanisms for creating user-defined types.

The inclusion of a type system in XML Schema was somewhat controversial. Many experts felt it would be better to omit a simple-type specification and instead define a mechanism for supporting multiple-type systems. This would let the type system evolve separately from XML Schema and would let application designers adopt differing type systems that reflected their specific needs. Schema languages, such as Relax NG (which we'll look at in a future article), took this simple type-free approach. The converse (and winning) point of view among experts, however, was that it was important to have a single XML type system to ensure a common standard and

interoperability. So XML Schema is now tightly bound to its own data type model. Time will tell if this was the right choice.

Deriving New Simple Types

XML Schema supports three ways of deriving new types from old ones, including restriction, union, and list. Deriving by restriction defines a new type by adding new constraints to an existing type. This is by far the most commonly used approach, and it's the method we'll focus on in this article. Also useful is deriving by union, which defines a type as a combination of other types that are already defined. Last and least useful is deriving by list.

The names of these methods sound deceptively simple, but nothing could be further from the truth. A few examples will help make the approaches seem clearer, but to fully understand their subtleties, you should read a good XML Schema book or, if you're really brave, the specifications.

Deriving By Restriction

Restriction is the most commonly used derivation mechanism, and it is in fact used in XML Schema to define most of the 44 predefined types. This mechanism takes an existing type and adds new constraints to the allowed values. These constraints are applied to characteristic properties of values. These properties are carefully specified in the XML Schema specification. For clarity (or confusion, depending on your viewpoint), the specification calls these properties "facets."

As an example, suppose you wish to define an integer type called `myIntegerByteValue` that only allows integer values between 0 and 255 inclusive. You can derive this from `xs:integer` as follows:

```
<xs:simpleType name="myIntegerByteValue">
  <xs:restriction base="xs:integer">
    <xs:minInclusive value="0" /> <xs:maxInclusive
      value="255" />
  </xs:restriction > </xs:simpleType>
```

The `xs:restriction` means what it says, and it also defines the base type (`xs:integer`) for the derivation. The elements inside `xs:restriction` define the facets by

which the restrictions are applied. The `minInclusive` and `maxInclusive` facets have the obvious impact, setting the minimum and maximum integer values. As a result the following values (separated here by commas) would be allowed:

0, 0023, 255, 000255

Note that the leading zeros don't matter, as the constraint applies to the value resulting from converting the string into an integer, not to the string itself. In XML Schema the former is called the "value space," while the latter is called the "lexical space." It is called lexical because it refers to the representation of the data (as characters), rather than its value.

Here is another example defining a string type (`passwdString`), which must be between five and 10 characters long, not including spaces:

```
<xs:simpleType
  name="passwdString">
  <xs:restriction
    base="xs:NMTOKEN">
    <xs:minLength value="5" />
    <xs:maxLength value="10" />
  </xs:restriction>
</xs:simpleType>
```

This defines the subtype as a restriction of an `xs:NMTOKEN`. You'll recall that name tokens are restricted types of strings that can't contain spaces. The `minLength` and `maxLength` facets then define a lexical space restriction on the actual string's length (or how long it can be).

Note, a `NMTOKEN` allows a lot of characters that aren't supported by common password systems. An alternative is to use the pattern facet (via an `xs:pattern` element) to define the character pattern allowed by the value. For example, the following restricts the string to contain only a defined set of characters:

```
<xs:simpleType name="passwdString">
  <xs:restriction base="xs:token">
    <xs:minLength value="5" />
    <xs:maxLength value="10" />
    <xs:pattern value="[a-zA-Z0-9_-@]*" />
  </xs:restriction> <xs:simpleType>
```

`xs:pattern` defines a regular expression that must match to all allowed values. The pattern `[a-zA-Z0-9_-@]*` matches to strings (of any length) containing the lower- and uppercase letters a through z, the digits 0 through 9, and the underline, dash, and the at character, in any order. Once again, the `min-` and `maxLength` facets restrict the value to be the desired length.

The Schema pattern language is similar to the perl regular expression language

would have a special meaning when used in regular expressions).

Deriving By Union

Unions define a type as a combination of existing types. For example, suppose you want an element to contain a number representing hours or days (such as 1h, 10h, 3d) or a full-blown date (such as 2004-06-23). The former must be a custom data type (it's easy to define using `xs:pattern`; try it yourself or look to www.utoronto.ca/ian/articles/oct04 for a full example), while the latter corresponds to `xs:date`. Using unions we can create the new type (`intervalOrDate`) with:

```
<xs:simpleType
  name="intervalOrDate">
  <xs:union>
    <xs:simpleType> <xs:restriction
      base="interval" />
    </xs:simpleType>
    <xs:simpleType> <xs:restriction
      base="xs:date" />
    </xs:simpleType>
  </xs:union></xs:simpleType>
```

So, the `intervalOrDate` type is the union of the types inside `xs:union`. There is also a shorthand notation for this:

```
<xs:simpleType
  name="intervalOrDate"> <xs:union
  memberTypes="interval xs:date" />
</xs:simpleType>
```

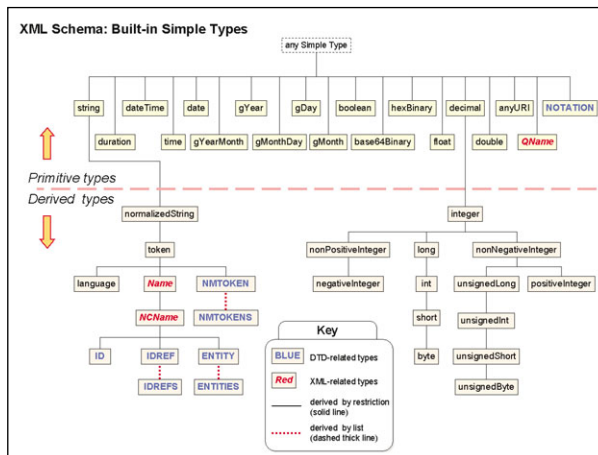
Deriving By List

Deriving by list is a special case that's used in the Schema specification to derive the `IDREFS`, `ENTITIES`, and `NMTOKENS` types. This mechanism is really of little use to Schema authors, so we won't go into depth here.

So much for simple types. Next month we'll look at how namespaces fit in. And if you thought things were complex up to now, brace yourself. **CPU**

by Ian Graham

(Full examples [plus others] are available at www.utoronto.ca/ian/articles/oct04.)



All the predefined XML simple types are derived from the "any simple type." For example, the `nonPositiveInteger` type is derived by restriction from the `integer` type, which is derived by restriction from the `decimal` type, which is itself derived by restriction from the "any simple type."

(generalized, however, to support Unicode characters). The language is complex, but it's worth learning because it's a powerful and flexible tool for defining custom simple types. Lists of allowed values are often specified using `derive by restriction`. For example, the following defines a type that supports just the three values "strategy," "tactics," and "other...":

```
<xs:simpleType name="selectOptions">
  <xs:restriction base="xs:NMTOKEN">
    <xs:pattern value="strategy" />
    <xs:pattern value="tactics" />
    <xs:pattern value="other\\.\\.\\. " />
  </xs:restriction> </xs:simpleType>
```

You will note the use of `xs:pattern` to define the three allowed string patterns. The backslash, in this case, "escapes" the period. Otherwise, this

faster.txt

You're the Webmaster. When the server crashes, you're the guy who has to restart it. When your site gets linked by someone else, you get the fan mail and hate mail. And when someone else is huge, you cry in your Cheerios wishing you had a faster server, a fatter pipe, and more time, knowing that countless people want to see your site and can't.

Most Web sites get a few hundred, or if you're lucky, 1,000 page views a month. And most can handle it if hundreds of users read pages simultaneously. But what do you do when it all hits the fan? Thousands of people are trying to read your page. This is the stuff that gives you your 15 minutes of fame. A link from a site like Fark or Slashdot leads to links from Yahoo! or Wired. But your server needs to keep up with these high traffic sites. You should have been better prepared.

I write this for users of Apache. That's probably you because you are a technically savvy user reading a magazine geared toward people who know the score. Many of these ideas translate to other servers, but read your documentation to figure out how.

First, think about the number of pages your server can serve at once. You can use the simple `ab` program, which comes with Apache, to test this. The `-c` parameter controls the number of concurrent requests. Try every multiple of five until you start getting errors. Find the sweet spot—that number where pages are still being served under two seconds. Then go into Apache and set the `MaxClients` to a number slightly smaller than that.

Yes, it might seem slightly counterintuitive, but you'd rather serve 25 people fast than 50 people slow. The larger your pages, and the longer they take to generate, the more true this is. Once a server is overloading, it will start to thrash about.

Second, look at the page people are loading, and make it as fast as possible. If you're running a plain old HTML site, you might be limited. You could remove a few graphics, or combine

two images into one larger one. But if you're using PHP, Perl, or some other scripting language, the options are endless. Figure out what parts change and how often they change. Then think about caching.

If everyone sees the same page, and you have 300 lines of PHP to generate your home page and 1,000 readers trying to load it all at once, you would probably be better off using `cron` to generate the page once every 30 minutes.

Next, set all of your time-out values to be tremendously short. Many browsers take their sweet time loading pages. But when you have a traffic spike, you simply can't afford to make three users wait while a guy on a 14.4Kbps modem tries to view your site while downloading files. Give readers five or 10 seconds and then time them out.

If possible, turn off your swap space. If your Web server is trying to serve 25 requests a second, hitting swap space could trigger a collapse. You don't want to risk it.

This last trick is especially important if your site has any large or computationally complex pages: Move graphics to a dedicated server. You

don't need a dedicated machine. Run something such as `Boa` on port 8080 and have it do nothing but serve images. Apache is a Swiss Army knife for the Web, but there's a reason a chef has a dozen knives at his disposal. Using a fast, lightweight HTTP server for graphics will free up your Apache processes to serve your core HTML, which usually requires a lot more CPU time to generate.

Once you've optimized, run `ab` again and note your changes. This is the sort of thing you should do after you make any substantial code change. Do it once a week with a `cron` job so you're aware if any change you thought might be inconsequential is hurting you. ■

I'm a Webmaster, too. Email me at malda@cpumag.com



Rob "CmdrTaco" Malda is the creator and director of the popular News for Nerds Web site Slashdot.org. He spends his time fiddling with electronic gizmos, wandering the 'Net, watching anime, and trying to think of clever lies to put in his bio so that he seems cooler than he actually is.

Apache is a Swiss Army knife for the Web, but there's a reason a chef has a dozen knives at his disposal.

by Joan Wood

I Want My Star Trek Communicator



After a decade of video engineering, Joan migrated to game development, co-founding Xatrix Entertainment and producing the two Cyberia titles. As president of indie developer Mango Grits, she talked 3Dfx out of prerelease Voodoo hardware and developed flying game Barrage for Activision, then co-founded and ran hardware review site SharkyExtreme.com as managing editor. Ensnared in Silicon Valley, Joan currently plays with small, wearable PCs and big, rackmount vis-sim image generators while secretly plotting to save the world through a series of international location-aware multiplayer handheld games.

Being constantly immersed in new technology tends to skew one's view of change. As science fiction becomes science project, and R&D turns into product design, we tech journalists get to go along for the ride, often experiencing the future before it's fully packaged and marketed for public consumption. This is truly wonderful and also probably the biggest reason we stay up late missing deadlines. The downside is that we become somewhat jaded. By the time products reach store shelves, we are already onto the next exciting thing. (NV40? Old news. R420? Been there. Grantsdale? PCI Express? SLI 2004? Done thaaaaa . . . well, not that last one just yet.) Having two tech weenies in the house seems to have a multiplicative rather than additive gadget factor, so I'm fairly well surrounded by tech. But now that my better half goes nowhere without his Bluetooth earpiece, I'm faced with an odd and totally unexpected repulsion.

It can't be some latent esthetic sensibility (10 years wearing headphones for a living permanently alters all perspective on that score) or even sound quality, which is somewhere between crinkly candy wrapper annoying and adequately clear. I don't believe it is about being haunted by a 1960s Space Opera either. Commander Uhura (Holster your phasers, Redshirts. I know she was only a Lieutenant in the original series, but you don't call him Ensign Kirk now, do you?) was a pioneering Bluetooth babe in the era of rotary dial phones. She may have used clunky wireless hardware to issue those mostly futile attempts at interstellar communication, but that didn't seem the least bit odd. Not in reruns anyway. So, what is it?

Maybe it's the consumer complement to creeping featurism. I'm a demanding customer, and I want more-better-now. If the Bluetooth earpiece was developed way back in the 1960s by some Desilu art director, shouldn't we be on version 86 by now? Why don't we have the Next Generation Star Trek Communicator? The one that you gently touch to activate, speak your intended recipient's name, and get an instantaneous direct connection? Well, why don't we?

Actually, we do. Vocera Communications (www.vocera.com) introduced a "wearable instant voice communication" system back in September 2002. The small (1.4 x 4.2 inches), lightweight (2 ounces) VoWLAN (voice-over-WLAN) clip-on or lanyard style badge features voice command connection and telephone system integration to allow users to reach out beyond other in-building mobile workers. Targeted initially at medical facilities and large retail establishments, the system puts everyone instantly in touch with everyone else, and that is the proverbial Klingon in the mix.

What kind of behavioral protocol will we need to develop to facilitate useful instant distance communication? Will we evolve the ability to multiplex conversations? Live television production requires some

members of the crew to actively listen to two audio feeds (one in each ear) simultaneously: one with the actor's dialog, the other a production channel with all the camera and switching directions. It sounds difficult, but you get used to it

after awhile. I'm not sure what that does to your brain, but it definitely improves your concentration.

In a hospital setting, where paging systems are already the standard for urgent communication, instant VoWLAN makes a lot of sense. Saving a life must be a highly motivating factor driving adoption of rapid communications technology. But in a standard working environment, it could lead to chaos. Even with the DND (do not disturb) feature, the challenge of managing group nonproximity-based verbal communication could be a nightmare. The social conventions that allow sequential uninterrupted dialog (it used to be called being polite) for proximity-based verbal communication don't necessarily translate to the virtual world. If your co-workers (not to mention, your boss) could instantly invade your aural space with a request for that latest budget figure, how in heck would you get anything done? On the other hand, you would save a lot of time tracking down the IT department. Bring it on. ■

Commander Uhura was a pioneering Bluetooth babe in the era of rotary dial phones.

Beam joan@cpumag.com

IT'S SHOWTIME



Talk about box office hits. Verbatim's new DigitalMovie™ DVD recordable media is so hot you can almost smell the popcorn. Available as DVD-R or DVD+R, this 4X speed DVD media looks – even feels – like a Hollywood movie reel. But don't think you need a director's chair to use them. These mini-reels are perfect for home movies, business presentations, transferring files – anytime you want to add a little fun to the show. And of course, DigitalMovie DVD has the same unsurpassed performance and reliability you've come to expect from Verbatim. So make your next show a feature presentation. DigitalMovie DVD from Verbatim. It's the reel thing. For more information, contact us at 800-421-4188 or online at www.verbatim.com.

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PUT YOUR WORLD
ON VERBATIM

Road Warrior

**iPAQs & iPods, Another Intel Delay,
PCI Express Goes Portable & More From
The Mobile Front**

New iPAQs Arrive

In late July HP added new low-end and high-end iPAQs to its popular line of Pocket PCs. The HP rz1715 is a low-end model that replaces the company's older h1945. On paper the rz1715 appears to be lacking a bit compared to the h1945. The rz1715 uses a 203MHz Samsung processor, while the older h1945 relies on a 266MHz Samsung CPU. The rz1715 also comes with less memory, with 25MB available compared to 56MB available with the h1945. For whatever reason, HP ditched the smooth, rounded corners often associated with its iPAQ line in favor of an angular look. The rz1715's appearance is almost reminiscent of HP's old Jornada line of Pocket PCs. HP replaced its Jornada line almost as soon as the merger with Compaq was complete, opting for Compaq's more stylish and popular iPAQ line. The rz1715 and h1945 both sell for \$279.99.



HP's new iPAQs include the angular low-end rz1715 (above) and the h6315 (below), which support voice over GSM/GPRS, Wi-Fi, and Bluetooth.

It doesn't really matter how unimpressive the rz1715 is, however, because news of the h6315 Phone Edition overshadows it. The h6315 supports voice over GSM/GPRS, Wi-Fi, and Bluetooth networks. Users in a corporate environment can use the company's Wi-Fi network to place voice calls, while users on the road can use T-Mobile's GSM and GPRS networks. If you're close to an Internet-connected Bluetooth system, you can even make voice and data connections over Bluetooth. The h6315 automatically uses the fastest network available and can fall back to another network if one network fails.

The unit uses a Texas Instruments processor running at just 168MHz, and it runs on Microsoft Windows Mobile 2003 Software For Pocket PC – Phone Edition. The handheld features a 3.5-inch transreflective TFT, an integrated VGA (640 x 480) camera, 64MB of SDRAM, and 64MB of flash memory. It also includes an integrated keyboard mounted below the display making it look like a close cousin to palmOne's Treo 600. Measuring 4.68 inches long x 2.95 inches wide x 0.73 inches deep, the h6315 is just a little taller and wider than the Treo 600 and about 0.5 ounces heavier. At press time the h6315 wasn't officially available, but according to HP, it will sell for \$599.99 through T-Mobile.

HP also lists an h6315 unit for business users. It includes GSM/GPRS, Wi-Fi, and Bluetooth support but includes a 200MHz TI processor and 75MB of memory. The keyboard and camera clip to the bottom of the business version. ▲

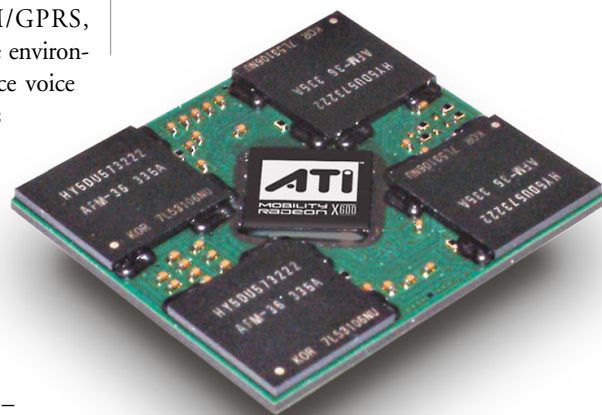


PCI Express Graphics Go Mobile; Become Upgradeable

Despite Intel's recent Alviso delay, video card manufacturers are going ahead with PCI Express video chips for mobile systems. ATI already has information available online on its X600. The new chip will use x16 PCI Express lanes to send and receive data twice as fast as AGP-based graphics.

ATI has also announced its new AXIOM form factor. AXIOM provides a removable graphics module that makes it possible for users to upgrade their graphics to newer ATI products. The X600 will come in an AXIOM package along with other physical packages.

Like AXIOM, NVIDIA's MXM will allow users to upgrade to new NVIDIA graphics modules. All indications are that NVIDIA is developing a new PCI Express graphics chip known as the NV41M. At press time NVIDIA had no official information available, but rumor has it that the video card will use a 6800 non-Ultra core. ▲



ATI's new X600 uses a PCI Express interface to move data twice as fast as AGP-based graphics chips. Both ATI and NVIDIA are also planning upgradeable graphics modules for notebook systems.

The Seriousness Of Mobile Viruses

During September 2000 two Palm OS Trojans (Liberty and Vapor) and one Palm OS virus (Phage) were released. Despite the fact that there was no reliable way to spread such viruses, the press seemed certain the situation was going to get worse, and antivirus companies immediately began offering antivirus programs for Palm OS and Pocket PC. In the four years since Liberty, Phage, and Vapor, we've heard relatively little about mobile viruses.

Recently, however, a virus-writing group known as 29A has written two viruses that attack Symbian smartphones and Pocket PC devices. Neither virus is particularly destructive and is more of a proof of concept than anything else.

In mid-June, members of 29A sent the Cabir worm to antivirus companies. The worm infects smartphones running the Symbian OS and spreads via Bluetooth. The virus isn't destructive and merely displays the name Cabir if launched. In July a member of 29A released the Dust virus, which targets Pocket PC devices and may be spread through email, infrared, Bluetooth, or removable media. Again, the payload isn't particularly destructive, and the virus even asks permission before replicating. A message reading "Dear User, am I allowed to spread?" appears when the unit is infected. If you tap Yes, the virus spreads to EXE files on your Pocket PC. ▲

Grantsdale Hits The Road

Even if Intel didn't push back Alviso, we'd still be seeing next-generation notebooks based on desktop components making their way to the market this fall. Wrapping desktop components in a mobile box is a common way for notebook manufacturers to offer next-generation features ahead of real mobile offerings and a good way to cut costs. Heat and reliability, however, have plagued some notebooks made from desktop components.

Just before we went to press, Canadian notebook manufacturer Eurocom announced it would offer its Phantom D900T this fall. The system combines an Intel 875P northbridge with a new ICH6 southbridge and a new Socket 775 desktop processor. The notebook will include support for DDR2, SATA, and PCI Express graphics, with a choice of NVIDIA's NV41M or ATI's X600. Eurocom plans to make the notebook available in mid-September. ▲

Alviso Delayed

We hope you weren't looking forward to having a next-generation Centrino notebook under the tree this Christmas. After delaying its Dothan launch and experiencing recent troubles with its desktop 915 and 925 chipsets, it's probably not too surprising that Intel has officially delayed the introduction of its next-generation Alviso mobile chipset. Alviso will offer SATA, PCI Express, and high-def audio to mobile users for the first time. The new chipset will also support a faster 533MHz FSB. Intel had hoped to ship the chipset to manufacturers this fall in time for Alviso notebooks to appear before the end of the year. Although Intel still plans to deliver Alviso to manufacturers before the end of the year, you'll have to wait until early 2005 before Alviso notebooks are available. ▲

Cool Things To Do With Your iPod

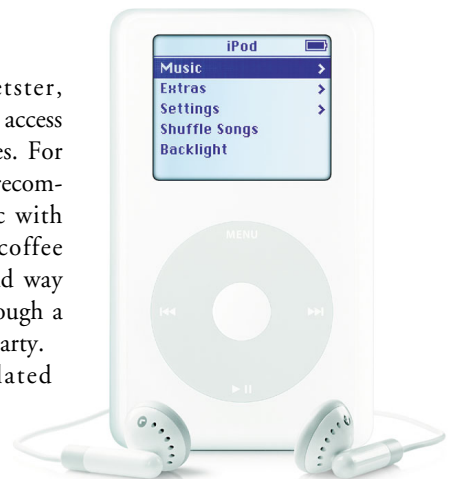
Don't look now, but that iPod you bought just last year is obsolete. Apple released its fourth generation of the iPod in July, and the popular Click Wheel on the iPod mini has made the transition to the bigger iPod. In addition, new power-management features mean up to 12 hours of battery life. The new iPod is also sleeker and slimmer than previous generations, and with the new releases, Apple has dumped the 15GB version. The 20GB and 40GB models are about \$100 less, selling for \$299.99 and \$399.99, respectively.

Of course, there's never a shortage of cool things you can do with your iPod. BMW is now offering an integrated iPod adapter for its 3 Series, X3 and X5 SAVs, and Z4 Roadster. The BMW-installed adapter fits in the glove box so there are no wires running through the car. Once connected, you can control your iPod through the steering wheel audio controls.

If you want something slightly cheaper than a BMW, there's always Simeda's Pocketster Pro. If you haven't heard of Pocketster (about \$15), it's a Pocket PC program that lets you share music on your Pocket PC with nearby wireless-enabled systems. The Pocketster Pro also includes an iPod module that lets you share your iPod tunes. You'll need a Pocket PC with host-USB capabilities (such as Toshiba's e800) and any cables or adapters necessary to connect the iPod to the Pocket PC via USB. After

you configure Pocketster, other Wi-Fi users have access to your iPod music files. For legal reasons, we don't recommend swapping music with others at your local coffee shop, but it's not a bad way to play your music through a friend's computer at a party.

In other iPod-related news, there was still no official response from Apple at press time in relation to a legal response toward Real Networks' Harmony software. As you probably are aware of by now, Harmony lets users play music purchased from the RealPlayer Music Store on an iPod. Previously, users haven't been able to play proprietary formats that other music download services use. ▲



Apple's next-generation iPod is sleeker than previous models and includes the popular Click Wheel from the iPod mini.

At Your Leisure



Plug In, Sit Back & Fire Away

The entertainment world, at least where it pertains to technology, morphs, twists, turns, and fires so fast it's hard to keep up. But that's exactly why we love it. For the lowdown on the latest in PC entertainment, DVDs, consoles, and just stuff we love, read on.



Star Wars Trilogy First Time On DVD. Ever.

It's the one you've all been asking for since the creation of DVDs. Yes, the original **Star Wars Trilogy** is here for you to enjoy over and over again. The question on all of your lips: Are the original versions included? No. But these aren't quite the special editions produced in 1998, either.

There are some big changes in store. Han shoots at the same time as Greedo. Hayden Christensen appears in ghostly form in "Return Of The Jedi," and Luke doesn't scream as he falls down the shaft in "The Empire Strikes Back." All three films *look* incredible. Truly. They look like they were just made within the last few years. The sound is rendered in both Dolby Digital 5.1 and 2.0, and it's wicked cool. Extras include thoroughly informative commentaries with Lucas, Carrie Fisher, sound designer Bob Burtt, and special effects guru Dennis



Muren on all three with director Irvin Kershner joining in on "Empire." A fourth disc filled to the brim with extra features

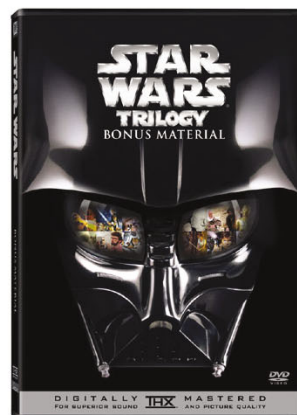
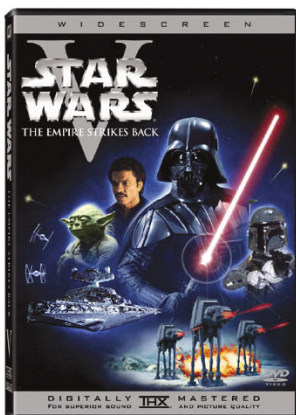
will thrill some and disappoint others. There's a full-blown documentary concerning the making of all three films clocking in at 2:30 hours. There's a featurette on the lightsaber, a look at Vader's return in next summer's "Star Wars Episode III: Revenge Of The Sith," and you'll find just about every trailer or commercial ever made to promote these three films.

Is it a good set? Absolutely. But is it the best we'll get? Doubtful if you look back at all the VHS iterations of the original trilogy. We'll have to wait until all six films are finished before Lucas truly pleases us. But will he ever be done with all three films? Only he knows for sure.

(For a look at other DVD releases, see "DVD Byte" online at www.cpubmag.com/cpuboct10/DVDs.) May the force be with you.) ▲

MPAA Rating: PG • LucasFilm

Star Wars Trilogy, \$49.99
www.starwars.com



Doom 3

I Want My Mummy!



Ideazon Zboard & Doom 3 Keyset

If gaming luxuries are your bag, you'd do well to pay attention to the Doom 3 Keyset. It might also be an ideal add-on for those interested in doing game-themed case mods. The keyset is \$19.95, but the base unit Zboard will set you back \$49.99. You can read up on the Zboard on page 18 of the July *CPU* and at www.ideazon.com.



Is Doom 3 worth the wait and the hype? Absolutely. id has built a game that serves to both create "Aliens"-like tension while showcasing a brilliant new graphics engine to potential licensees around the world. You've seen the screen shots, but you can only truly appreciate the engine—with its glorious dynamic lighting and all manner of graphical features—when you see the game being played on a high-end PC. (To our surprise, it also ran well on a lower-spec machine.)

The storyline is essentially a retelling of the original Doom. The game begins with your arrival on Mars. There's a brief lag as you wander around, gape at the graphics, and learn the controls. Eventually, horrors are unleashed as a portal to hell is opened and all manner of fearsome beasts emerge. Unlike the original Doom, you're not placed into massive enemy battles, but instead are left sneaking around corners with genuine dread of the horrors that lurk in the darkness. The game is very tactical, and safeguarding your ammunition is tantamount to continued success.

A design decision was made to not permit the use of a flashlight while wielding a weapon, which seems oddly out of place for a futuristic marine. That noted, we understand why—id



wanted to build tension and fear, which it pulls off incredibly well. (If the flashlight issue really bugs you, check out this mod at ducttape.glenmurphy.com.) Also, and unlike previous id games, there is a story being told (via the use of your PDA), which gives solid insight into the lore. Level design and atmosphere are without fault. The multiplayer game has four modes and is simplistic; hopefully it'll be better fleshed out by the mod community.

Buy the game, turn out the lights, and crank up your surround-sound speakers (cranked Logitech Z-680 5.1 speakers are highly recommended) to maximize the 20- to 25-hour experience. No game has ever made us jump in our seats with such unerring regularity. Doom 3 is action-game-of-the-year fodder and the most frightening gaming experience we've ever had. A word of advice: Not recommended for gamers prone to heart problems. ▲

ESRB: (M)ature • Activision

\$54.99 (PC; Xbox TBA)

www.doom3.com

ESPN NFL 2K5 vs. Madden NFL 2005

There's A New Sheriff In Town

The 2004 NFL season is finally under way, and what better way to supplement hours of televised coverage from Sunday morning until late Monday night than spending hours more playing a football video game? We recently got our thumbs in football shape playing Sega's ESPN NFL 2K5 and EA Sports' Madden NFL 2005 for more than a few hours each and emerged with a clear favorite. As you'll see, we didn't choose as our winner the game we have chosen in such comparisons over the past several years, but as ESPN's Chris Berman likes to say, "That's why they play the games."

Graphics

For the past several years, we've preferred the look of Madden to the competition, but this year the team at Visual Concepts (developers of 2K5) brought its A-game. ESPN 2K5 looks better than Madden in pretty much every way, the lone possible exception being coach models. (Coaches in 2K5 tend to look somewhat deformed.) ESPN 2K5's player models look better and move more smoothly and naturally and,

combined with its ESPN-themed menus and stat boxes, make the overall experience seem more like watching a game on TV. Madden, on the other hand, looks pretty much the same as it did last year.

Sound

There are lots of things to consider when evaluating a football game's overall sound quality, and 2K5 does a better job than Madden at just about all of them. For example, both games provide plenty of music during games and while you're navigating various menus, and both games' Xbox versions let players rip their favorite tracks to the console's hard drive for use in the game. The key difference, however, is that 2K5 for Xbox lets you play your custom tracks during actual games (it even lets you select specific songs for particular situations), whereas in Madden your tunes only play in the game's numerous menus and practice modes. And although we much prefer the Madden-Michaels team for play-by-play and commentary to 2K5's fictional Dan Stevens and Peter O'Keefe, voice audio in Madden occasionally seems muffled, sometimes to the point where we had a hard time making out what referees and even the announcers were saying. We also liked 2K5's peripheral voice work (Chris Berman, Trey Wingo, Suzy Kolber, etc.) better than the nongame voices in Madden.

Gameplay

Sega's NFL 2K series has come a long way in the control department, evolving from an arcade-ish model where your players could instantaneously change directions 180 degrees to its current, pleasing blend of speed and realism. Madden is no slouch in the control department, but it feels slower than 2K5, and pro football is a mighty fast sport.

Extras

Both games offer scads of peripheral features. We like Madden's Franchise



ESPN NFL 2K5 is the best-looking football game ever. Check out the detail in everything from the uniform textures to lighting effects. Players also look smoother and more realistic than Madden's.



"He...could...go...all...the...way!" Randy Moss schools another DB in Madden NFL 2005. Realism, check.

mode better than 2K5's, and we especially like Madden's Training Camp exercises as a way to improve our players' stats while we learn the ropes. 2K5's Practice mode offers similar help for players (real ones, not the virtual kind), but in order to advance your team's skills prior to games, you have to fiddle with Weekly Preparation, which isn't really much fun. We like the Trivia Machine and Dart Board mini-games in 2K5's Crib feature, but aside from that, there was too much interior design for our taste. Both games offer great online options, thanks to EA's recent integration of Xbox Live (it's about time, EA), although GameCube owners won't get online play in Madden.

At The Gun

We could go on for pages about both of these games, but in the end we liked 2K5's presentation and gameplay better than Madden's. That's not to say Madden NFL 2005 isn't a good football game; it's really very good, and fans of the series won't be disappointed. But ESPN NFL 2K5 is a little better game at a much better price, and that equals a touchdown in our book. ▲



ESPN NFL 2K5

ESRB: (E)veryone • Sega

\$19.99 • PS2, Xbox

www.espnvideogames.com/nfl2k5

Madden NFL 2005

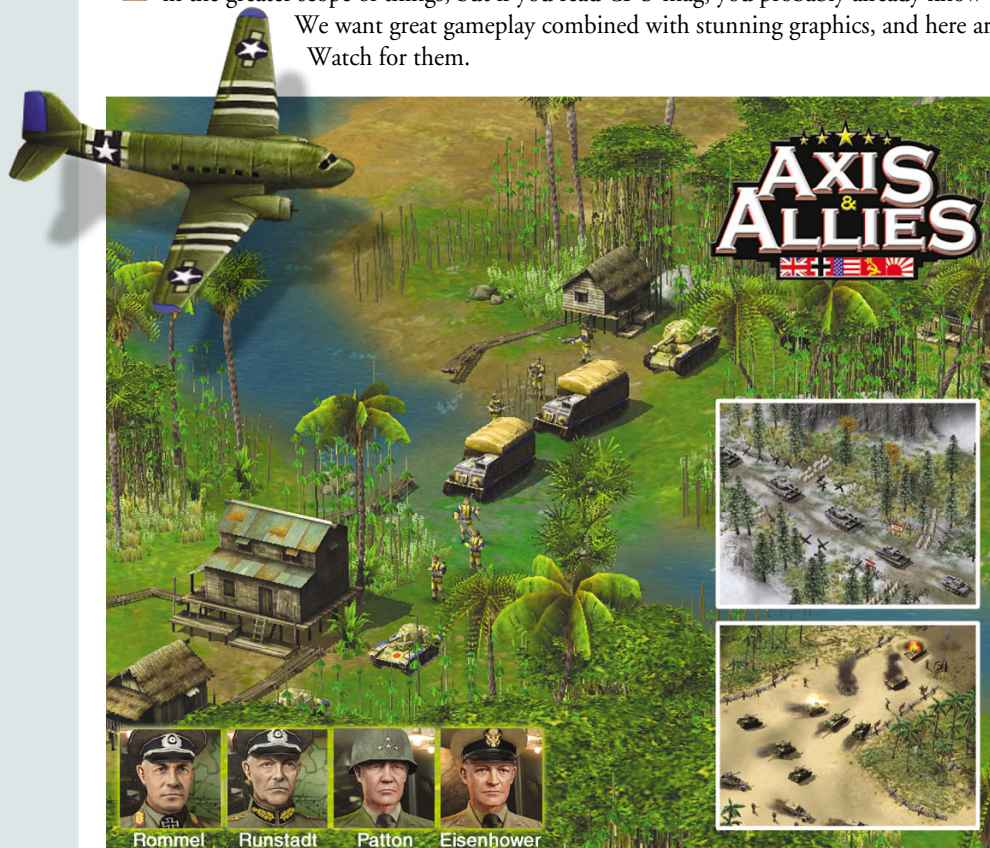
ESRB: (E)veryone • EA Sports

\$49.95 • NGC, PS2, Xbox, PC

www.easports.com/games/madden2005

Hot Shots: The Beauty Of The Game

Yeah, we know it's all about the gameplay. Sure, there are those who would have you believe graphics are relatively unimportant in the greater scope of things, but if you read *CPU* mag, you probably already know those folks are off their collective rockers. We want great gameplay combined with stunning graphics, and here are two upcoming games that show promise. Watch for them.



Axis & Allies (PC). The A&A board game hits the PC. You'll have options to stick to a high-level turn-based game (similar to the board game) or the hands-on real-time strategy mode. The developers have come upon an RTS style that rings through to the game's origin. A&A is expected by the holidays. You can find more details at www.axisandalliesrts.com.

Infinite Loop

Clean Up, Already

Spam invading your inbox? Need to sweep away the clutter every day to find your important mail? Perhaps a post office in Brooklyn should have broken out the broom—a few decades ago. In August 1967 a woman vacationing in New Jersey sent her mother living in Pennsylvania a postcard. Sounds normal enough. Here's the catch: Mom didn't receive the card until July 17, 2004, almost 37 years later. Apparently the postcard had fallen behind a machine at a post office and wasn't found until the machine was recently moved. ▲



Sid Meier's Pirates (PC, Xbox). Ye olde classic hybrid strategy-RPG game of open seas exploration is being reimagined for the 21st century. And now Xbox gamers can partake, as well. Expect the game on shelves by mid-November. You can find details on this latest iteration at www.atari.com/pirates.

Despite the booming economy a rowdy band of 16 men offers to join your crew. Current crew: 60.
 Welcome aboard mates!
 Sorry lads, we're full.

diy recording

Your Sound Studio On A Shoestring

When you're ready to move from the garage and let an audience hear your music, you'll have two choices: Pay \$100 or more an hour for studio recording time or do it yourself. We're guessing you'll pick the latter. Once you've successfully wired your guitar and/or keyboard to your computer, here are three suggestions for recording, editing, and authoring your music.

Steinberg Studio Case Collection

Cubase SE is Steinberg's entry-level music production package. You just need a MIDI keyboard, midlevel PC, and to get



acquainted with the app. Cubase SE takes you from recording a source through mixing and editing. You can apply various EQ settings and effects to individual channels, and there are several editors available: waveforms, MIDI, percussion, etc. The feature control offered for this price is stunning, as are the documentation and tutorials.

Steinberg bundles SE versions of five pro-level Virtual Studio Technology instrument titles: Groove Agent SE (drum), The Grand SE (piano), Virtual Guitarist SE, D'cota SE (analog and wave synth), and HALion SE (sampler). Each has a learning curve, but Groove Agent and Virtual Guitarist let you quickly twist prepackaged tracks into your own creations.

There's no support for surround sound, and Steinberg caps you at 48 stereo tracks, 16 VST instruments, and eight effects. Higher-end Cubase versions remedy this. ▲

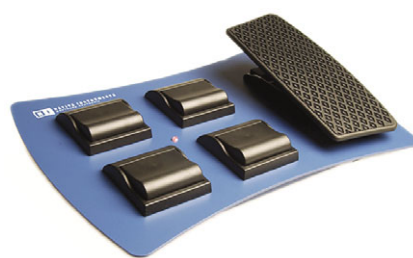
Steinberg Studio Case

\$300 • Steinberg
www.steinberg.net

Native Instruments Guitar Rig

Holy Hendrix. Forget every effects box, foot pedal, and specialty amp you've ever coveted. Guitar Rig does what has been nearly impossible until now: accurately emulate amps, cabinets, mics, and effects. NI has painstakingly sampled gear spanning the 1960s to the present and bundles Rig Kontrol, a four-way switch and foot pedal board you control through the desktop UI. We plugged our cheap Fender clone into the foot board, ran the output into our Audigy 2's bay panel input, and sat in awe of the magnificent results.

NI supplies dozens of preset stack configurations, but you can rearrange and replace components at will; all feature the same adjustment controls you'd find in professional gear. You can adjust whether



your virtual mic is in front, back, or at an angle to the amp, and how far it is from the speaker. You can also add dozens of amps. Guitar Rig has two recording decks, and you can save recordings as WAV files for pouring into an editing app. Simple in concept and impeccable in execution, Guitar Rig is a must for any six-string player. ▲

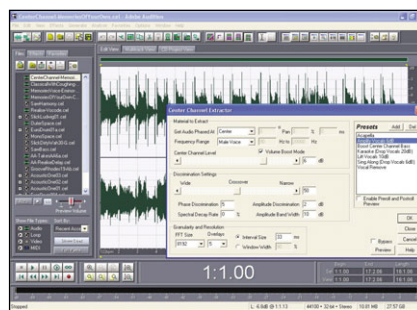
Guitar Rig

\$499 • Native Instruments
www.nativeinstruments.de

Adobe Audition 1.5

Audition 1.5 is a 128-track (stereo) recorder, mixer, editor, and authoring package with 5,000 free audio loops, over 50 DSP tools and effects, and support for nearly 24 audio file formats. Whereas Cubase SE accommodates 24-bit, 96KHz audio, Audition 1.5 supports 32-bit, 10MHz audio. Seriously.

Adobe now includes waveform editor and restoration (think pop/hiss removal)



plug-ins here and has improved them. The app also provides tools for isolating specific frequency ranges and applying effects to them or eliminating them. Someone miss a note in your voice recording? Use the pitch correction editor to fix it. Need to sync your soundtrack with a movie project? Audition's better integration with the Video Collection (in which Audition 1.5 is included) has the tools to help.

Adobe includes reference master burning to CD, 5.1 surround mixing and export, VST and DirectX plug-in support, and several GUI changes. Audition rocks. ▲

Adobe Audition 1.5

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SOFTWARE TIPS & PROJECTS

TV In Your Pocket

DO CONSUMERS REALLY WANT TO CARRY FILM TRAILERS, HOME VIDEOS, AND TV SHOWS IN THEIR POCKET?

Hardware manufacturers sure hope they do because several portable multimedia players are going on sale this season. But before you dive into buying a \$500 handheld video player, try out the idea of portable video on the devices you already have. As we explored here last issue, it's possible to get many of the benefits of a next-gen portable video player with a combination of this-generation technologies: a PC, a Pocket PC, and some of Microsoft's free add-ons, such as MM2 (Movie Maker 2) and WME 9 (Windows Media Encoder 9). This issue we show you how to use these same tools for recording TV programs.

You'll need a TV tuner, either an all-in-one video card with TV input capabilities or a TV tuner add-on card such as the ATI TV Wonder. Most of these cards also come with personal video-recording software for recording TV to your PC. While the MM2 and WME 9 programs were not designed for PVR duties, they do work in lieu of TV tuner software, and, for our purposes, they can record a TV stream in the format we need for a Pocket PC.

Make Movie Maker Make TV

Make sure that you have the latest version of MM2 from www.microsoft.com/windowsxp/downloads/updates/moviemaker2.msp. (NOTE: MM2 may not work with some older TV tuner cards.) In MM2, from the File menu, select Capture Video to start the Video Capture Wizard. In the Video Capture Device screen, highlight the relevant Available Device for your TV

input. Now choose the Audio Device and Audio Input Source. Set the Input Level slider to three-quarters.

Select TV Tuner from the Video Input Source drop-down menu and click Configure. On the Configure Video Capture Device screen, click Video Settings. We will reduce the video stream to 208 x 160 pixels, but for now, simply use the Output Size default 320 x 240 resolution for recording this initial TV stream. Also make sure the frame rate is at its default value of 29.970fps. Click OK.

Back on the Configure Video Capture Device screen, click TV Tuner. Set the channel and click Apply. Click Close. (It is important to click Apply after choosing the channel because clicking OK often will not record the change.) Back in the wizard, click Next, type a file name and location for the raw stream, and click Next again. In the next window, choose the video quality of the recording. Click the Other Settings radio button and use the drop-down menu to find the selections for Pocket PC. For a decent frame rate and image detail in the final video, choose Video For Pocket PC (218 Kbps), which delivers about 20fps with the correct display size. The 143 Kbps option results in a choppy 8fps, and the Full Screen 218 Kbps option records at a higher resolution than you need.

Click Next to bring up the Capture Video window; you should now be able to see and hear the channel. Unlike PVR time-shifting software, you need to manually start the recording, but you can set the

bottom box in this window to automate the duration of the recording after it starts. MM2 will automatically divide your recorded stream into shorter clips, usually making a split when it detects a major shift of scene. We recommend you avoid this default by unchecking the Creates Clips When Wizard Finishes box. This will keep your TV recording in a single clip that you can splice later. Click Start Capture to begin saving the stream. You don't need to get the start time precise here because

WinXP Tip Of The Month

Get More Tools At The Start

Administrative Tools is one of the most powerful features in the Windows XP arsenal, but it is often overlooked because it sits within the Control Panel. Various Tools utilities, such as the Computer Management console, give you direct access for managing all of your hardware devices, user accounts, performance logs, disk defragmenting, drive letters, and shared drives and folders. Bringing these tools onto the Start menu lets you see and use them more often. Right-click the Start button and choose Properties. In the Taskbar And Start Menu Properties window, click Customize and select the Advanced tab. In the Start Menu Items box, scroll to the bottom of the list to find System Administrative Tools. Activate the radio button labeled Display On The All Programs Menu And The Start Menu and click OK. Click OK again to enable the change. Administrative Tools will now appear on the top level of the Start menu and as a menu on the All Programs list. ▲

Registry Tip Of The Month (WinXP)

Disable CD Burning

System administrators may want to restrict corporate PCs from burning discs for a variety of reasons. To do this via a Registry tweak, open the Registry Editor and go to HKEY_CURRENT_USER\SOFTWARE\MICROSOFT\WINDOWS\CURRENTVERSION\POLICIES\EXPLORER. Right-click in the right pane and click New and DWORD Value. Name the new Value NoCDBurning. Double-click the new Value and change the Value Data to 1; click OK. You will need to restart for the change to take effect. ▲

MM2 lets you easily snip out leads and commercials later.

Edit Your TV

After recording, MM2 will process the stream and create a clip that goes into the Collection window. It will also create a WMV file at the location you designated earlier. If you want to edit the recorded TV file, click and drag the clip to the storyboard at the bottom of the screen.

You can edit the recording and eliminate unnecessary leads and commercials. For example, click Show Timeline and place your cursor at the beginning of the clip in the storyboard; the cursor turns to a two-way red arrow. Click and drag the cursor slowly to the right and watch the current frame in the video preview window to the right. Release the cursor where you want the clip to begin, and MM2 automatically splices out the lead you marked off.

To convert your TV show to a final product, select Save Movie File from the File menu. In the Save Movie Wizard, select My Computer and click Next. In the following screen, type a file name, select a location, and click Next. In this screen, if there is only one radio button available, click Show More Choices. Click the Other

Settings radio button and use the drop-down menu to choose the Video For Pocket PC format. Click Next to finish.

It has been our experience that MM2's estimates of final video file sizes can be way off. Generally, one minute of 208 x 160 video is 1.6MB, which means that a 30-minute show could exceed 50MB and require removable media to transfer and play it back on a Pocket PC.

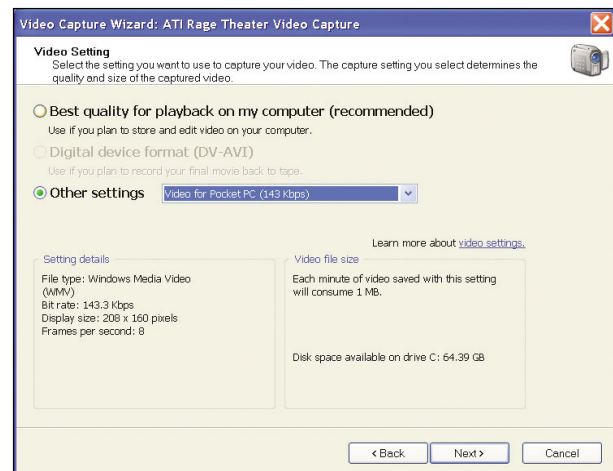
I Want My Media-Encoded TV

The WME 9 program is not as versatile as MM2, but it, too, can record a stream directly from a TV tuner card. When WME 9 opens, the New Session window also opens. (If the window does not open, click New Session on the toolbar.) To configure the device, on the Wizards tab, select Capture Audio Or Video and click OK. In the Device Options screen, use the Video and Audio drop-down menus to designate the proper TV tuner device and audio device. Next, click Configure next to the Video drop-down menu to bring up your TV tuner's Capture Properties box. On the TV Tuner Properties tab, type the channel and select TV Tuner in the Inputs drop-down menu.

Once you have set all your options, click OK or Apply until you're back to the New Session Wizard. Click Next to name your output file and click Next again to choose Pocket PC from the Content Distribution window. Click Next to advance to the Encoding Options. To get the optimal final file size, for Video, select Pocket PC Standard Video, and for Audio, select Voice Quality Audio. Click Next to go to the Display Information screen and label the video file. Click Next. On the Settings Review window, click Finish.

In the main encoder screen, you should see and hear your live TV stream in the Input display. Click Start Encoding to

start the capture. You can edit on the fly by clicking Pause during commercials and stretches in the show and then clicking Start Encoding again to keep recording into the same file. Clicking Stop ends all recording and finalizes the file. You can



Movie Maker 2 lets you record a TV stream directly into a Pocket PC video file format and roughly estimates the file size needed for each minute of video.

transfer this 208 x 160 resolution video to your Pocket PC. **CPU**

by Steve Smith

Infinite Loop Booming Bouquet

Where's that music coming from? Perhaps from the bouquet behind you. A Japanese technology firm, Let's Corporation, has developed a way to make flowers and plants produce sound much like conventional speakers. Let's starts with an acrylic tube that contains an oscillating component and a magnetic coil. Technicians insert the flowers into the tube and apply an alternating electrical current, making the tube and flowers vibrate at a high speed, which produces the sound. According to Let's, the flower speaker systems can reproduce audio from the radio or CDs. Sounds like every rose has its tune. ▲

Source: www.newscientist.com

WARM UP TO PENGUINS

Customize Your Built-In Firewall, Part II

IN SEPTEMBER'S *CPU* (PAGE 99), WE LOOKED AT IPTABLES, THE CURRENT KERNEL-LEVEL FIREWALL IN LINUX (KERNEL 2.4.X AND LATER).

That article focused on understanding the rules you might currently have in place in your firewall. In this article we'll discuss how to make changes to existing rules and how to add new ones.

Making Changes

You can make changes directly with iptables on the command line or you can edit the file or script that your distribution uses to store your iptables settings. Exactly which file or script this is depends on your distribution, and you may have to create a script on your own. We'll focus here on working with iptables interactively because doing so means you don't have to restart the firewall after making changes, which you'd have to do if editing a file or script.

The first thing to know when changing rules is that it's easiest to specify the rule by its line number. Rather than trying to count the rules so you know which is which, the `--line-numbers` flag can be quite useful. For example, from a command prompt type `iptables -L --line-numbers` to see all your current rules (if you have your firewall active and tables loaded). You can see an example of this in Figure 1.

There are numerous tasks you might want to try, including deleting existing rules, deleting entire chains, adding new rules, adding new chains, and editing existing rules. You may also want to move a rule from one chain to another and reorder rules so that the most specific rules are first and the most general are

last. (Remember, it's the first match that matters with iptables.)

Remove Rules & Chains

We'll go through the rule tasks one at a time. The simplest is deleting because this merely involves removing something from a chain. To remove a particular rule, you type

Going Remote

Need to remotely administer both Linux and Windows machines? One option is the free tool VNC (www.realvnc.com), which runs on both platforms and lets you remotely access the GUI in both cases instead of needing to just SSH into your Linux boxes. There's nothing quite like calling up a Linux GUI desktop while on your Windows Desktop, or vice versa. ▲

`iptables -D chain rule` (where *chain rule* is the specific chain rule you'll use) at a command prompt as root. In Figure 1 you can see a rule that accepts FTP requests. To remove it you would type `iptables -D RH-Firewall-1-INPUT 6`. When it comes to deleting an entire chain or even all your tables at once, you have a few options (as the root user from a command prompt):

- To empty your entire set of firewall rules, use `iptables -F`
- To empty a specific chain of rules, use `iptables -F chain`, such as `iptables -F INPUT`

- To delete an empty, custom-made chain (not INPUT, OUTPUT, or FORWARD), use `iptables -X chain`, such as `iptables -X RH-Firewall-1-INPUT`

Add New Rules & Chains

Creating a new rule begins with typing `iptables -A chain`. So, to add a rule specifically to the input chain, you would begin your rule by typing `iptables -A INPUT`. The next component is the meat of the rule, which helps you to define exactly the packets this rule should apply to. Unfortunately, iptables rules are a complex subject because you have to understand the internal workings of TCP/IP and many other issues. For more information, some resources include:

- The iptables man page (type `man iptables` at a command prompt)
- The iptables Tutorial; iptables-tutorial.frozentux.net
- Search iptables Tutorial at Google

For an example of building a set of rules, let's say that we want to block all incoming SSH connections to our internal network, block all outgoing SSH connections from our internal network to the outside (which uses the network address 192.168.10.0), and let an administrator connect to our internal network from home via SSH (so we need to create an exception) with the home IP address of 10.30.5.9.

This example is somewhat complex, yet it deals with just one service, so it doesn't require a book to explain. The first thing to do is look in the file `/etc/services` and see what it says for SSH, which is:

```
ssh 22/tcp # SSH Remote Login Protocol
ssh 22/udp # SSH Remote Login Protocol
```

So, the SSH protocol and tool uses both TCP and UDP traffic (both are part of TCP/IP) on port 22. This is vital to know because you have to allow or block both of these protocols on the port, not just one.

Otherwise, some things will partially work or be partially broken. Knowing this information and being very precise, all our rules for this situation will be in pairs, one for TCP and one UDP, beginning with:

```
iptables -A INPUT -p tcp -m tcp
iptables -A INPUT -p udp -m udp
```

The `-p` flag refers to TCP/IP, meaning this is tcp, udp, icmp (ping and similar traffic), or all of these. We're not using

collection of flags gives us the following pair of rules:

```
iptables -A INPUT -p tcp -m tcp -s
10.30.5.9 —dport 22 -j ACCEPT
iptables -A INPUT -p udp -m udp -s
10.30.5.9 —dport 22 -j ACCEPT
```

The remaining two examples are equally nonspecific, so the order doesn't matter as long as they come after the more specific rules. Both deal with the same port, but in this case they refer to *all* source addresses except for those on our internal network and *all* destination addresses that are outside the internal network, respectively. To set up these rules, we'll use a little trick to specify "any address that's not within the class C network 192.168.10.0."

To specify "not" with iptables, you use

an exclamation point (!). So, to specify "not the class C 192.168.1.0" you would use `! 192.168.10.0/24`. (24 denotes the 24-bit netmask for a class C.) We will send back an error message for anything that matches this rule, so we'll assign a judgment of DENY. If we change our minds later, we can come back and change it to DROP. So, this pair of rules might look like the following for blocking any attempts to SSH to something outside the internal network:

```
iptables -A OUTPUT -p tcp -m tcp -s !
192.168.10.0/24 —sport 22 -j DENY
iptables -A OUTPUT -p udp -m udp -s !
192.168.10.0/24 —sport 22 -j DENY
```

Notice that this time we're looking at the OUTPUT chain because this pair of rules is for outgoing traffic. Also, we are referring to `—sport`, or "the source port," rather than the destination port. Finally, we want to prevent all incoming attempts to SSH to

anything on our network, whether it's the internal one or external one. To say "all" for the source or destination, you use the format 0.0.0.0/0. So we have:

```
iptables -A INPUT -p tcp -m tcp -d
0.0.0.0/0 —dport 22 -j DENY
iptables -A INPUT -p udp -m udp -d
0.0.0.0/0 —dport 22 -j DENY
```

Type all these and type `iptables -L` and you'll see these rules in place. Voila, you're firewalling.

Firewall Up

Next month we'll explore iptables and firewalls in more depth. We're still really just learning the basics here, so consider checking out some of the sources mentioned previously for more background. **cpu**

by Dee-Ann LeBlanc

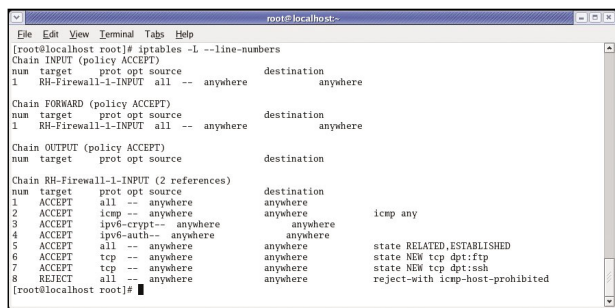


Figure 1. This example shows a set of iptables rules with line numbers included. You'll also notice a rule that accepts FTP requests.

all because we want to be very precise. The `-m` flag loads special features for the protocol in question. From here you need to remember that iptables goes with the first rule that matches a particular circumstance, so you need to order your rules from the most specific to the least specific. The most specific of these is the third factor where we want to let an employee use SSH from a specific home address so she can fix things. So, we'll create this rule first.

For this first rule, we want the administrator to connect to port 22 on any machine inside our network. Thus, port 22 is the destination port. You specify this destination portion with the phrasing `—dport 22`. The IP address the administrator is connecting from is the source address. Specify this address with `-s 10.30.5.9`. Finally, to let the traffic matching this rule into the network, the final judgment is ACCEPT, which we include as `-j ACCEPT`. This

Infinite Loop

Who Dunit?

A criminal tries to wipe his prints clean at the scene of a crime. In his haste, however, he misses several objects. That one mistake could send him to the big house. According to the NIST (National Institute of Standards and Technology), the best computerized systems that automatically match fingerprints are accurate more than 99% of the time. NIST scientists recently tested 34 systems from 18 companies using 48,105 sets of fingerprints from 25,309 people for 393,370 distinct images. The accuracy (with a false-positive rate of 0.01%) varied according to how many fingerprints were being matched from one person. Using single-finger tests, the best system was accurate 98.6% of the time. Two-finger tests produced accurate results 99.6%, and the best system was accurate 99.9% of the time if the test involved four or more fingers. ▲



www.sciencedaily.com/releases/2004/07/040716080142.htm



Lighten Up.

It wasn't so long ago that if you wanted to bring your data with you, your hardware had to come too. Well, that's all in the past now thanks to the new SanDisk Cruzer™ Mini. At under half an ounce, the Cruzer Mini goes anywhere, and with up to 256MB of flash memory, it takes a lot with it. Hi-speed USB 2.0 compliant, SanDisk's Cruzer Mini lets you transfer data faster than ever before. And at less than 8mm thick, all it needs is a single USB slot. Just drag, drop, and go. It's all about convenience – no extra hardware, no worries.

So whether you're installing utilities or updating print drivers for the umpteenth time, you can take your files with you wherever you go – and you won't even need your dolly.



For more information on SanDisk Cruzer Mini, visit www.sandisk.com/smart

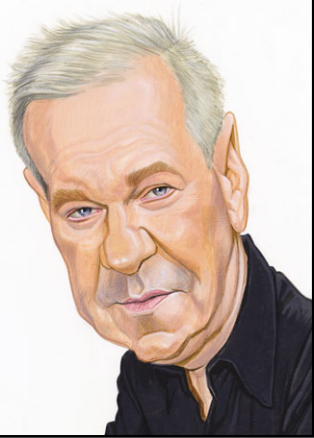


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by Mike Magee

Chip Designs Tread Water



Mike Magee is an industry veteran. He cut his teeth on ancient products like the Dragon and the Japanese PC platforms long before the IBM-PC won. He worked for a corporate reseller in the mid-'80s and saw the Compaq 386 sandwich box and every GUI known to humankind. Mike decided that the way to go was the Interweb around 1994 after editing PC mags in the late '80s and '90s. A co-founder of The Register, Mike started the chip-driven INQUIRER (www.theinquirer.net) in 2001. He has contacts from top to bottom in the business, spanning the entire chain, who help him root out interesting rumours and speculation.

There's a disturbing trend apparent over the summer months that the big vendors of hardware don't seem to want to acknowledge. They're not selling as much computer equipment as they expected. But the fact is that they did expect this a few years ago. NVIDIA, ATI, Intel, and the other big boys were all hoping that Microsoft's Longhorn would give the industry a big boost. As we now know, that's slipped to 2007—nearly a lifetime in the computer industry. (The 64-bit version of Windows XP is now due out in the first half of next year.) And while Doom 3 might have boosted sales a bit in early August, it doesn't seem to be enough to cause hordes of people to rush to the shops to buy Pentium 4 Extreme Edition machines.

The truth is that all the exciting features introduced this year such as PCI Express, better sound and multimedia capabilities, faster memory, and the rest won't really begin to come into their own until next year. The enthusiasts and the power computer users know that next year microprocessors are going through a sea change with the introduction of dual cores. So they're not going to be easily enticed into paying the top whack for top technology knowing that there's more to come, and soon.

The latest chip roadmaps we saw from Intel only hint at that future. Smithfield, its first dual-core processor which uses the LGA775 socket, will use the Glenwood and Lakeport chipsets, and Intel is predicting it will arrive in the middle of 2005. That is being positioned by the chip firm for multithreaded and multitasking environments in the digital home and digital office. Haven't we heard this before somewhere?

By the time you read this, Intel will either have introduced or be just about to introduce a 3.46GHz LGA775 version of the Pentium Extreme Edition, and it has a 3.73GHz with 2MB cache using a 1066MHz frontside bus slated for November. These chips are targeted, it appears, at high-end gamers. But it's far from clear whether the features, even coupled with fast hard drives and well-made PCI Express graphics cards, will be

enough to attract such people into spending \$2,000 or more. The high-end Extreme Edition is going to cost \$999 just by itself and demand all sorts of technology to cool it down and make it deliver at speed.

As you may have read, Intel's future CEO, Paul Otellini, announced that the firm will not now produce a 4GHz Pentium 4 this year. In fact, the roadmaps that we've seen show that the 570 and the 580 are meant to be Intel's top chips until the middle of 2005. The 570 is an 800MHz 3.80 Pentium 4, and the 580 is the 4GHz chip, now slated for the first quarter of next year. Despite all attempts to get the tide to turn, like a modern King Canute, Intel tacitly admits behind the scenes that its Netburst P4 technology has hit the technology ceiling.

Behind the scenes, we know that NVIDIA and ATI are both absolutely livid at the delays to the PCI-E platform. The executives don't say this in public because they have to work with the Chip Tiger and can't risk stepping on its own tail. But they have adjusted their roadmaps to target the end of this year, as well.

AMD, as we pointed out in our last column, also has dual-core processors slated for the middle of next year. But we think the introduction of its Sempron cut-down chips has more significance than meets the eye. It will eventually migrate to 90-nanometer technology, have larger caches, and be sold at such low prices that Intel will have to react. Although AMD is targeting these chips at the "value" end of the market, I think that this technology is well able to do most of the tasks anyone but an absolute top-end speed freak might need. AMD is protecting its future by perhaps realising that demand earlier than Intel, which has higher speed Celeron Ds using the LGA775 socket to offer this year and next. ■

**... we know that
NVIDIA and ATI
are both absolutely
livid at the delays to
the PCI-E platform.**

Send rumours to "Mad Mike" Magee at Mike@cpumag.com.

Technically Speaking

An Interview With Ed Graczyk, Director Of Microsoft TV

Every once in awhile, you stumble across a bigger story than you thought you had. We originally tapped Microsoft in search of a couple of IPTV-related sound bites for *CPU's* "Under Development" article. After five minutes on the phone with Ed Graczyk, director for Microsoft TV, however, we soon realized there was a much bigger, far cooler tale to be told.

Starting out, we thought that IPTV (Internet Protocol TV) was a nifty technology, like so many others, nearing the end of its first R&D cycle. What we didn't realize is that IPTV draws a line of fire between the 20th century television experience we still pay for every month and the overhauled multimedia experience we will soon find indispensable. Get ready for a pleasant surprise. ▲

by William Van Winkle



CPU: Let's start at the beginning. What is IPTV?

Graczyk: Some people confuse IPTV with delivering TV over the Internet. They think you just log into your broadband provider with your PC and suddenly you get 250 TV channels. That's not what we're talking about at all. Just like you get TV services from a cable operator today on a closed, managed network that happens to be over one type of technology, with IPTV you get those same services. In fact, you can get some cooler stuff over a closed, managed network that happens to be two-way, broadband-based on Internet protocols. The display device is still a TV set. You're not talking about little jerky thumbnail videos or anything like that. It's high quality all the way up to high-definition TV.

CPU: So it is still just TV. What is the big deal?

Graczyk: IPTV enables an operator to do some pretty cool things that aren't possible on today's traditional broadcast TV infrastructure, like that used by satellite companies or just over-the-air broadcasters. Some of the cool features are as basic as instant channel changing. If you are a cable, digital cable, or satellite subscriber, you're probably used to this one- to two-second delay as you tune from one channel to the other. We tune channels in milliseconds because unlike traditional TV environments today, where you need a physical hardware tuner in your set-top box, we do all that in software. That not only gives us this instant-tuning capability, but it also gives us the ability to deliver applications very cost-effectively where you've got multiple streams of video on your TV screen at one time. The easiest way to think of this is picture-in-picture.

CPU: But you can display more than two channels simultaneously?

Graczyk: Exactly. And one of the reasons, like on TiVo today, you can only record one show at a time rather than watch one show and record another is because there's only one tuner in that box. Well, with this virtual-tuning capability, you can do things like create an on-screen program guide where you're looking at a screen of six different channels to see what's on now. Not only do you have the text and graphics for that channel, but you've got thumbnail live video streams of what's actually playing on that channel in real-time. And that can be not only your broadcast programming but also on-demand programming. So maybe one channel's tuned to something that's coming off a hard disk DVR in your set-top box or one channel's tuned to a VOD [video on demand] stream coming off a server in the network. We can enable those kinds of cool multimedia program guide features.

CPU: So this mountain of channel content is being piped to some local head-end

via fiber, and users are essentially special ordering just the stations they want to go out over that last mile of copper?

Graczyk: Yes. You may have access to hundreds or potentially thousands of channels, but you're only switching the two or three channels being watched at any given time over that last leg. This assumes multiple TVs in the home. You could have a household with a high-def TV and two to four standard-def TVs, all on different channels at the same time, over that 20Mbps pipe. But you still have access to all those other channels.

CPU: Or we could use a grid or picture-in-picture to watch those half-dozen stations all at once on one screen.

Graczyk: Right. The other common scenario with multiple streams to the home is watching one program and recording one or two or three others.

CPU: The number of streams we can record simultaneously is then just limited by broadband bandwidth and local PC or set-top encoding resources?

Graczyk: Essentially. The idea of physical tuners no longer exists in an IPTV environment.

CPU: When do we get to ditch the set-top box and run all of this out of home theater PCs?

Graczyk: Well, that's kind of the next step. We're working with some of the chip manufacturers, companies like ST Micro, and it is creating a new generation of chips called system-on-a-chip. It's essentially one piece of silicon that has all the hardware components needed for a set-top box. It'd be produced in big volumes at very low cost, and then that chip can be embedded in all kinds of devices. We think you'll still have traditional set-top form factors, but those will evolve pretty dramatically. You'll have set-tops with hard disks, set-tops with DVD burners built in. This could also be embedded in the TV set itself or a gaming platform.

CPU: What about bandwidth? Coax has a ton of headroom, but DSL is pretty stuffed already. Where is all of this video data going?

Graczyk: There are a couple ways to look at that. First, we're seeing telcos making big investments in their network. Companies like SBC are bringing fiber closer to the home and, in some cases, all the way to the home to improve bandwidth. SBC said these investments will enable it to deliver 15 to 25Mbps to the home over fiber.

Also, ADSL version 1 is in the market today. At relatively short distances, that can support up to 6Mbps, although typically that's ratcheted down by service providers. But there are other, newer standards around DSL, the most current being ADSL2+ that actually supports nominal bit rates up to 7,000 to 8,000 feet of over 20Mbps. Now, at these speeds, we can deliver at least one high-def stream and three or four additional standard-definition streams and still have enough bandwidth left over for high-speed data and voice and other apps like home security. The reason we can do that is we're using advanced video-compression technology like Windows Media 9 that allows us to deliver a high-definition stream at, today, around 6 to 8Mbps, as opposed to about 20Mbps with MPEG-2. Standard definition is a fraction of that, about 1.5Mbps. We can deliver these over DSL, whether it's standard ADSL or all the way up to ADSL2+.

CPU: Are virtual channels the tip of the iceberg? Is there more to this platform that we'll see in two or three years?

Graczyk: At the start, you'll see companies come out with competitive offerings. If SBC wants to compete for pay-TV subscribers, it has to come out with something that's at least as good, if not better than, what that subscriber could get from

his cable or satellite provider. Things like hundreds of digital channels, video on demand, digital video recording, interactive program guides—all of those features that a lot of people more and more are taking for granted. On top of that, you've got cool features like the instant channel changing, multimedia program guides, and a virtually unlimited number of channels or programs available because, again, we're not broadcasting and we're not limited by the pipe. You could have 1,000 TV channels available to that subscriber if you could figure out a way to kind of present that volume of content in a way that's easy to navigate.

I think the coolest stuff will be because this technology is all based on IP. With IPTV, an operator could do things like unified messaging. Say you're at home after dinner watching your favorite TV shows. You get the inevitable solicitation phone call from a telemarketer. Well, you get this notification that pops up on your screen that says so and so is calling, what do you want to do? Using your remote control, you can just send that call off to voicemail or to a recording that says if you're a solicitor, hang up and take us off your list. You could do things like photo and music sharing using the TV's remote control.

CPU: And there's no more need for a media adapter in the middle.

Graczyk: Exactly. Or you don't have to copy the photos to a Memory Stick and pop it in the DVD, or, like what TiVo does with its service, you don't have to upload your photos to some Web-based service. Just keep those files available on your network, and you've got access to them. With IPTV, your TV basically just sits on your home network as an intelligent device in the home network. Then the TV can participate in these connected-home scenarios, which really it can't do today on the cable front. 

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Under Development

A Peek At What's Brewing In The Laboratory

Computerized Clothing? Step On It!

Sure, we've heard about jackets with flexible LCD screens built into them and people who run around with miniature heads-up displays strapped on their noggins, but the first instance of wearable computing for the masses may be adidas' forthcoming running shoe, simply called "1." The 1 uses a microprocessor and other components built into the sole to help judge and create the appropriate amount of heel cushioning for each footfall.

adidas likens the mechanism, now wrapping up three years of development, to a human reflex nerve. A magnet rests at the bottom of the midsole. Above the midsole, just under the user's heel, is a sensor. The integrated processor scans the distance between the magnet and the sensor roughly 1,000 times per second. (The chip can actually perform 5,000 calculations per second.) Shorter distances between the two components indicate greater compression of the heel. The biggest problem for adidas researchers was determining what values were supposed to be comfortable.

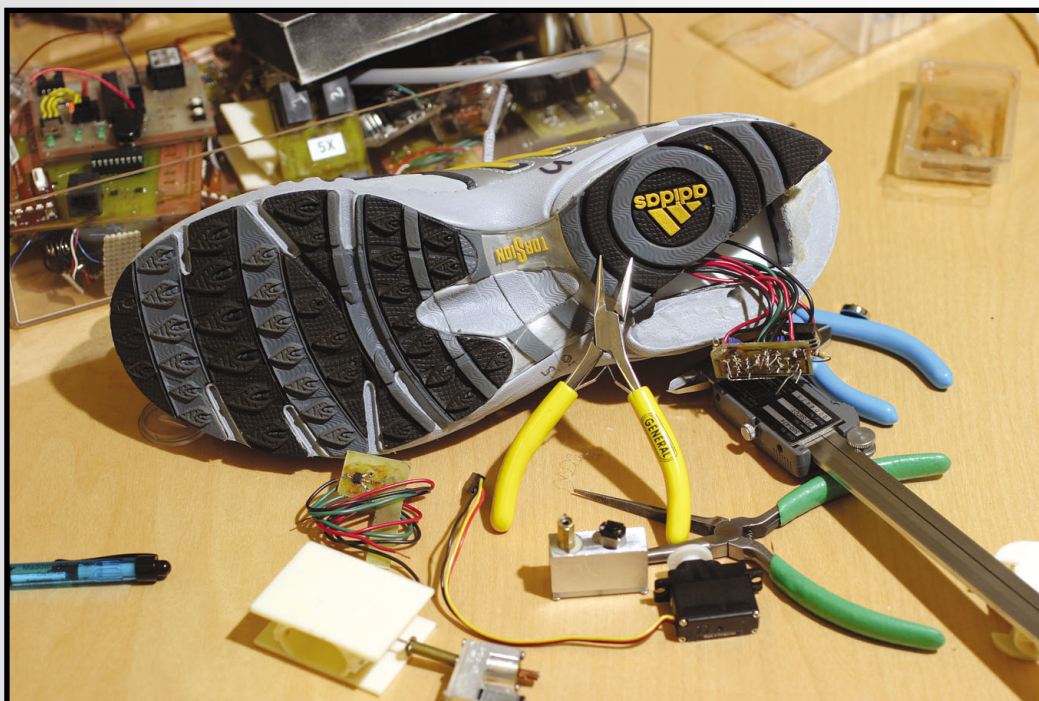
"We could download the information to see what a shoe thought of a run, then ask the runner what they thought," says Mark Oleson, the 1 project's electromechanical engineer, in an adidas

paper. "When the two matched up, that helped validate our sensor."

After extensive testing, researchers programmed the microprocessor with a preset zone of values within the processor, which the user could override and customize. During use, if the current compression values fall outside of this zone one way or the other, meaning the shoe is too soft or too firm, the CPU then instructs a motor to turn accordingly. The motor is connected to a cable that in turn connects to the plastic cushion within the heel. The tension on the cable determines the amount of give in the cushion, so the end result is that the shoe always feels comfortable

regardless of the user's weight—at least for the 100 hours that the onboard battery runs. (For a serious running shoe, 100 hours is the expected life span.)

No, the adidas 1, expected to retail for \$250 in December, won't fetch your email, but it probably won't crash, either. More importantly, if the shoe succeeds in the market, it could herald a wave of application-specific computerization for clothing. Imagine if jackets could integrate smart (and safe) heating elements or belts integrated motors and cables similar to the adidas 1 that could always provide just the right amount of tension, especially after a big meal. ▲



The adidas 1 will be the first computerized piece of apparel made for the mass market. The integrated processor and motor system helps to keep the shoe's comfort and support optimized during running.

What You See Is What You Question

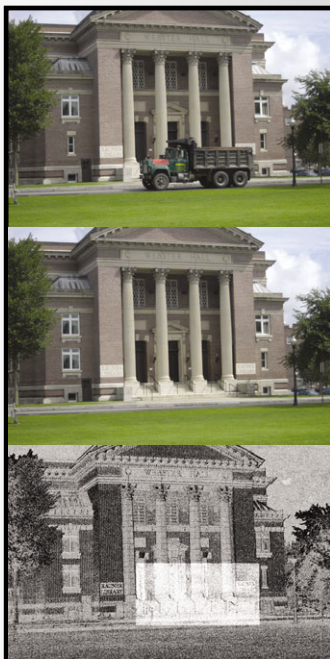
These days, if you see a picture on the evening news of Ayman Al-Zawahri (al-Qaeda's second-in-command) sharing a friendly beer with George W. Bush, would you believe it was authentic? Digital photo editing is a wonderful, potentially terrifying thing, and a good retoucher can create visual fiction that's impossible to debunk with the human eye.

Enter Hany Farid, Dartmouth associate professor of computer science. He has developed algorithms to examine images and search for different evidence of tampering. The question is: What manipulations are necessary to create a convincing forgery? Manipulations leave trails that can be detected mathematically as statistical perturbations introduced by the tampering. Farid's algorithms detect those perturbations.

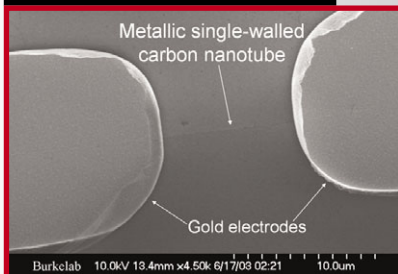
"We have found," Farid says, "that when splicing together two people into a single composite, part of the image has to be scaled or rotated to get the people to appear in the correct proportion and pose relative to one another. This scaling or rotating requires a portion of the image to be resampled or interpolated. This interpolation introduces very specific statistical correlations in the image, and although invisible to the human eye, they can be detected by our algorithm. As another example, when trying to remove a person or object from an image, one often copies and pastes other parts of the same image. This manipulation leaves two or more regions of the image with nearly identical pixel values. Without knowing the shape or location of these regions, it is computationally very costly to try to find them. We have, however, developed an efficient algorithm that can find these regions."

Farid has no doubt that others will develop countermeasures to foil his algorithms. His hope, though, is that evolving methods that succeed his will make digital forgeries increasingly difficult and costly for would-be fraudsters. In the meantime, he continues to devise new detection algorithms, including one that will "detect local traces of blurring that are inconsistent with the overall depth of focus."

We have to wonder if Farid's work will someday help spawn a digital art market where "pure" images are valued more highly than edited ones or an illegal underground market will develop for old-school photo fiddling in analog darkrooms. ▲



From top to bottom, you see an original image of Dartmouth's Webster Hall, then a retouched image with the truck replaced with a cut from another image and the lower-left window copied from the one above it. The next two images are the analysis output of different algorithms, the first revealing data that's been resampled and the second showing image areas that are suspiciously identical.



Assistant professor Peter Burke's single-walled carbon nanotube tests proved that nanotubes could someday function as high-speed transistors in computers, cell phones, and other devices.

UC Irvine Makes Mighty Leap With Nanotube Transistors

It seems every month nanotechnology scores new advances with the potential to dramatically enhance tomorrow's electronics. Recently at the University of California, Irvine, Pete Burke, assistant professor of electrical engineering and computer science, led a team that connected two gold electrodes with a single-walled carbon nanotube. Testing across a range of voltages, Burke found that the circuit could be switched on and off at a frequency of 2.6GHz, or about one-billionth of a second. The team's work is the first to demonstrate that single-walled nanotube transistor devices can function at such high speeds.

Burke's research places nanotubes in line for use as transistors able to operate in the microwave frequency range. In addition to being a fit for future high-speed computers, nanotube transistors could also serve in future cell phones. Burke adds that 2.6GHz is only the beginning. He places the theoretical speed limit for these nanotube transistors at 1THz, hundreds of times faster than the transistors in today's processors. Moreover, nanotube transistors would be 100 times smaller than today's silicon transistors, giving a new lease on life to Moore's Law.

Silicon transistors sport a speed limit of roughly 100GHz. Burke's team is now working to ascertain more precisely the real limit of nanotube transistors. In addition, there remains the problem of automating how to position and connect nanotubes within devices. Currently, such maneuvering requires hours of painstaking manual work for only a few connections.

"We are several years away from being able to manufacture nanotube electronics with millions or billions of nanotube transistors on a single chip," says Burke. "At the moment, I do not know how we will be able to do that. We are working on borrowing some ideas in my lab from biology to possibly have the circuits self-assemble, for example using DNA as the 'glue.'"

The professor hopes to have prototype nanotube transistors working at room temperature within two years. ▲

Back Door

Q&A With Bram Cohen

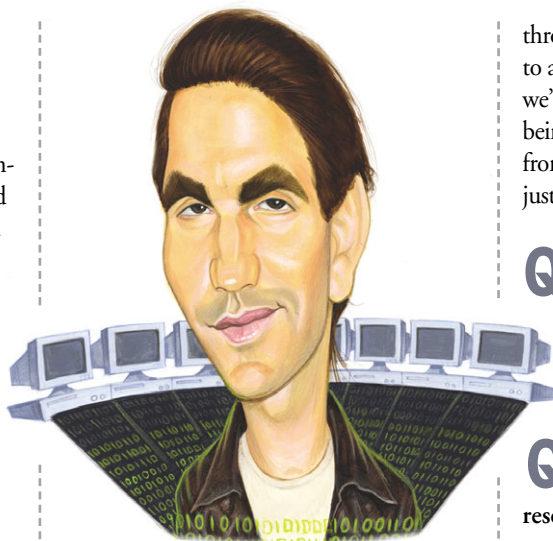
Bram Cohen, 28, has a mind that likes to master the unusual and build, which may explain why he felt he could do better than the standard peer-to-peer file sharing model found in Napster and its descendants and built a new sharing architecture: BitTorrent (bitconjurer.org/BitTorrent). BitTorrent specializes in swarm downloads, as when a must-have file hits the Internet and thousands of surfers swarm onto it, potentially crashing the server like a DoS attack. For Cohen, this is one more challenge to solve. For everybody else, BitTorrent may be the answer to tomorrow's media distribution needs.

Q For those who might be fresh to the P2P scene, what is BitTorrent and how does it differ from other sharing clients?

Cohen: BitTorrent is a file distribution tool, and it differs from other systems in two regards. First of all, its standard interface is much more straightforward to use, at least for people downloading stuff. When you want to download something, you just go click on a Web link and it starts downloading. Under the hood, it's much more aggressive than a lot of the other systems at figuring out what available bandwidth there is and using it. Part of that is that BitTorrent has this nifty trick of rewarding you for uploading based on how many bytes you upload. Uploading makes your download rate better, so it encourages people to upload.

Q Thinking about the RIAA and its infamous lawsuits, is BitTorrent more or less prone to monitoring by authorities than other P2P systems?

Cohen: That's kind of a complicated topic. The short answer is it's actually a lot more prone because it makes no attempts whatsoever to anonymize things. This is by design in order to do a good job of hooking up



peers to each other. For any given download, there's this central registry of everyone who's downloading it, and it's pretty easy to get all those peers. So in general, downloading something from a Web page using BitTorrent is quite a lot less anonymous than downloading using plain old HTTP.

Q That lack of anonymity doesn't seem to deter a lot of people from sharing copyrighted content.

Cohen: No, it doesn't.

Q Have you heard of lawsuits for swapping files with BitTorrent?

Cohen: I've heard of people getting sent notices because they were downloading stuff, and they're like, 'Hey, Bram, make it anonymous!' And I'm like, 'No!' There are like architectural reasons why it would be extremely hard to do that.

Q Would it entail a performance impact?

Cohen: It would be a tremendous performance impact. In order for me to download from you as a peer, I have to be able to connect to you and download from you. The only way to hide the fact that I'm downloading from you is for the data to be sent

through an intermediary, and that's going to at least double the amount of bandwidth we're sucking down, because instead of being sent from you to me, it's being sent from you to the intermediary to me. That's just going to obliterate the performance.

Q Are you planning to integrate file searching into BitTorrent?

Cohen: No, I'm not doing searching. Use Google.

Q If you were made High Lord of Copyright Law, how would you resolve the current fair use problems?

Cohen: I view this as sort of not my problem, although things like the Induce Act are just scary. The Induce Act is basically new legislation which says that if you induce someone to commit copyright infringement, then you're guilty of some crime. So like if you do something which causes someone else to commit a crime involving copyright infringement, then you're culpable for that. This is different from the older DMCA. This could easily be read to include writing a newspaper story which talked about how you could download files.

Q So in the Induce Act's eyes, you would clearly be guilty. This brings us back to the earlier point of knowingly enabling people to pirate copyrighted work. You don't seem to make any pretense about pleading ignorance.

Cohen: Well, it would be kind of silly for me to.

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William Van Winkle began writing for computer magazines in 1996. He was first published in 1990, the same year he took his first job in computers. He and his family live outside of Portland, Ore.



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